BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
WATER QUALITY STANDARDS AND	)	
EFFLUENT LIMITATIONS FOR THE	)	**R08-9 Subdocket C**
CHICAGO AREA WATERWAY SYSTEM	)	**(Rulemaking – Water)**
AND THE LOWER DES PLAINES RIVER:	)	
PROPOSED AMENDMENTS TO 35 Ill.	)	
Adm. Code Parts 301, 302, 303 and 304	)	

NOTICE OF FILING

TO: John Therriault, Assistant Clerk
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Attached Service List

PLEASE TAKE NOTICE that I have today filed with the Illinois Pollution Control Board MIDWEST GENERATION'S FINAL COMMENTS, a copy of which is herewith served upon you.

Dated: March 5, 2012

MIDWEST GENERATION, L.L.C.

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CERTIFICATE OF SERVICE

The undersigned, an attorney, certifies that a true copy of the foregoing Notice of Filing and Midwest Generation's Final Comments was filed electronically on March 5, 2012 with the following:

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and that true copies were mailed by First Class Mail, postage prepaid, on March 5, 2012 to the parties listed on the foregoing Service List.

/s/ Susan M. Franzetti

ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
WATER QUALITY STANDARDS AND EFFLUENT LIMITATIONS FOR THE CHICAGO AREA WATERWAY SYSTEM AND LOWER DES PLAINES RIVER PROPOSED AMENDMENTS TO 35 ILL. ADM. CODE 301, 302, 303, AND 304	)	**R08-9 Subdocket C (Rulemaking-Water)**

MIDWEST GENERATION'S FINAL COMMENTS

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MIDWEST GENERATION'S FINAL COMMENTS

I. Executive Summary

Midwest Generation, L.L.C. ("Midwest Generation") has been an active participant in this rule-making because the proposed use designations will directly affect several of the electric generating stations it owns and operates.[1] Midwest Generation supports the Illinois EPA's determination that the segments of the Chicago Area Waterway System ("CAWS") consisting of the South Branch of the Chicago River and the Chicago Sanitary and Ship Canal ("CSSC") and the Brandon Pool in the Lower Des Plaines River cannot meet the Clean Water Act ("CWA"), 33 U.S.C. §1251 *et seq.,* aquatic life use goals because of the applicability of several of the Use Attainability Analysis ("UAA") regulatory factors. Although Midwest Generation believes the Agency's proposed language for the aquatic life use designation it terms "Aquatic Life Use B" can be improved upon, it agrees that the extensive evidence presented in this rule-making persuasively demonstrates that the existing quality and potential of the aquatic community in these CAWS segments is severely limited based on conditions that satisfy UAA Factor 3: Sedimentation, Barge Traffic, Asian Carp controls, UAA Factor 4: Dams and other Hydrologic Modifications, and UAA Factor 5: the Physical Features in the water system.

[1] Midwest Generation is an independent power producer that owns and operates six electric generating stations in Illinois Exhibit 364, Prefiled Testimony of Julia Wozniak at 2. However, Midwest Generation has recently announced that it will close the Fisk Station on or before December 31, 2012 and the Crawford Station on or before December 3, 2014.

However, the Agency's determination that the Upper Dresden Island Pool ("UDIP") is capable of "minimally attaining" the CWA aquatic life use goals is not supported by the extensive scientific and technical evidence presented in this rule-making. Any contention that the UDIP is capable of supporting a diverse and abundant aquatic life is simply not fact based and certainly not in line with the actual data presented in this rule-making. Although the biological and physical conditions of the UDIP are somewhat better than in the immediately upstream Brandon Pool, they are still sorely lacking and cannot support a balanced, diversified aquatic population that satisfies the CWA's goals.

Based on the same UAA factors that support the determination that Brandon Pool cannot attain the CWA goals, the record clearly demonstrates that the UDIP cannot attain those goals. Any presumption in favor of the attainability of the CWA aquatic life goals has been conclusively rebutted by evidence showing that the impounded nature of the effluent-dominated UDIP, its habitat constraints, widespread sedimentation, commercial navigation, urban impacts, continuing control for invasive Asian carp and other equally irreversible conditions prevent the UDIP from attaining those goals. Further, the Agency's position that the UDIP does not satisfy any of the UAA factors is directly and expressly rebutted by its admission in Subdocket A of this rulemaking that the UDIP satisfies UAA Factor 4 – that the presence of "dams or other types of hydrological modifications preclude the attainment of the use and it is not feasible to restore the waterbody to its original condition or to operate such modifications in such a way that would result in the attainment of the use."[2] As required by the applicable regulations, the record evidence here is sufficient to support a technical and legally defensible determination that a

[2] "Post-Hearing Comments of the Illinois Environmental Protection Agency", R08-09(Sub-Docket A), dated April 1, 2010, at pps. 6-7, 11

"fishable" use is not attainable for the UDIP and to support the following proposed aquatic life use designation for the UDIP[3]:

> 302.237 Upper Dresden Island Pool Aquatic Life Use Waters
>
> Lower Des Plaines River from the Brandon Road Lock and Dam to the Interstate 55 Bridge shall be designated for the Upper Dresden Island Pool Aquatic Life Use. These effluent-dominated, urban-impacted waters are capable of maintaining warm water aquatic-life populations consisting primarily of lentic species of tolerant and intermediately tolerant types that are adaptive to the impounded, channelized and artificially-controlled flow and widespread siltation conditions created by the operation of the locks and dams that are necessary to maintain the existing navigational use and upstream flood control functions of the waterway system.

The above-proposed use designation language correctly describes both the limiting conditions in the UDIP and satisfies the regulatory requirement to express the resulting highest aquatic life use it is capable of maintaining. An appropriate use designation for the UDIP should recognize both its modified, urbanized and effluent-dominated nature as well as the fact that its main limiting factor is its impounded condition. This proposed rule does both. It aptly recognizes that those aquatic-life populations must be able to adapt to the highly impounded and channelized conditions as well as the widespread siltation present in the UDIP. These conditions are responsible for the limited quality of aquatic habitat present in the UDIP and are irreversible due to the need to protect the existing navigational use and flood control functions of the UDIP. Applying the relevant UAA factors, MWGen submits that this proposed language best reflects the applicable aquatic life use designation that should be adopted for the UDIP.

II. Overview

The South Branch of the Chicago River, the CSSC, the Brandon Pool and the Lower Des Plaines UAA segments are part of the busiest inland commercial navigation system in the nation connecting the Great Lakes and the St. Lawrence Seaway to the Mississippi River. For over a

[3] See 40 CFR § 131.6(f)

century, the waterway has had heavy industrial and commercial shipping on it, and at present 16 million tons of commodities moves through the CSSC with 12.4 million tons of cargo moving just through the Lockport Lock. Sometimes referred to as the "Upper Illinois Waterway" or "UIW", the waterway has been altered and managed, including reversing the flow of the Chicago River, to promote commercial navigation and to move wastewater and stormwater away from Chicago and Lake Michigan.

This is not a naturally flowing or free flowing river system. The flow in the South Branch of the Chicago River, into the CSSC, through the Brandon Pool and continuing to the Lower Des Plaines UAA segments is dominated by wastewater effluent, which is at times the only flow. These UAA segments are heavily and permanently modified because they are part of a lock and dam controlled waterway. The system is designed and managed to provide adequate flows and levels to accommodate barge traffic and handle periodic flow peaks, including flow peaks that are amplified by combined sewer overflows ("CSO") inputs.

Pursuant to UAA Factor 4, these segments of the CAWS and the Lower Des Plaines River cannot attain the CWA aquatic life goals because of the adverse effects of channelization, existence and operation of the dams and locks, as well as the flow controls and effluent-dominated nature of these UAA segments. The CAWS UAA Report correctly concluded that "the century old and well functioning and managed system of the [CSSC]…must be considered for the foreseeable future as an irreversible reality."[4] This equally applies to the UDIP portion of the Lower Des Plaines River. It is completely channelized to a minimum depth of 9 feet and is primarily used for commercial transport of bulk commodities such as grain, coal, petroleum

[4] Attachment A to Illinois EPA Statement of Reasons, UAA Report, at.2-22

products, chemicals and raw materials.[5] As the Board has stated in the past: "The waterway is a very artificial and significantly modified waterway that is limited in terms of habitat."[6] The record here shows that the habitat conditions haven't changed in the fifteen years since the Board made that finding. These UAA segments are still limited in terms of habitat. The dams reduce habitat diversity by eliminating riffles, reducing the amount of fast water, increasing sedimentation, disrupting normal sediment flow, interrupting or limiting migration, reducing the number and variety of aquatic insects, and reducing habitat complexity. The quality of the aquatic community in these UAA segments is not susceptible to any significant improvement precisely because of these existing and irreversible constraints. In its Subdocket A Post-Hearing Comments, the Agency also agreed that the UDIP satisfied the requirements of UAA Factor 4.[7]

Turning to UAA Factor 3, widespread sedimentation, including contaminated sediments, nutrients, and barge traffic are all human caused conditions and sources of pollution that prevent the attainment of the CWA aquatic life goals in these UAA segments. Sedimentation, and its derivative, turbidity, continues to flow into these waters from the surrounding urban areas, and in the case of the UDIP, from agricultural runoff as well. An abundance of unrefuted data from repeated field sampling work over the past decade and more conclusively proves that most of the UDIP has moderate to severe sedimentation with no signs of improvement. Just the mere presence of such extensive sedimentation severely degrades the quality of the habitat, particularly in the UDIP. But the adverse effects are greater because of the highly contaminated

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[5] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09, June 16, 2011 at 49. The Board issued the Final Order in Subdocket A on August 18, 2011 adopting four categories of recreational use designations for the CAWS and Lower Des Plaines River. The new rules were published in Volume 35, Issue 37 of the Illinois Register, dated September 9, 2011.

[6] *In the Matter of: Petition of Commonwealth Edison Company For Adjusted Standard From 35 Ill. Adm. Code 302.211(d) and (e), AS 96-10, October 3, 1996* at 6

[7] "Post-Hearing Comments of the Illinois Environmental Protection Agency", R08-09(Sub-Docket A), dated April 1, 2010, at pps. 6-7, 11

nature of these sediments (*e.g.,* petroleum aromatic hydrocarbons ("PAHs"), metals, and PCBs). The sediment sampling results identify the constant presence of highly contaminated sediments, including in limited areas of the UDIP that might otherwise provide some good fish habitat. More recent human-caused stressors include high levels of nutrients and emerging contaminants from personal care products and pharmaceuticals. Because of the commercial nature of the UDIP, Brandon Pool and the CSSC UAA segments, with its significant barge traffic and effluent-dominated nature from servicing the wastewater needs of the Chicagoland area, these conditions cannot be ceased or remediated.

With respect to the UDIP, if there could still be any doubt as to its inability to attain the aquatic life use proposed by the Agency, the adverse effects presented by the arrival of Asian Carp are the proverbial "final nail in the coffin." Even some of the proposed "solutions" planned for the UDIP to prevent the advance of Asian Carp to Lake Michigan would only serve to further impair the limited fish habitat area provided by the UDIP's Brandon Tailwater area.

No matter how one views the evidence in this proceeding, the inescapable conclusion is that there is insufficient good physical habitat in all of these UAA segments that prevents them from attaining CWA goals under UAA Factor 5. Habitat conditions in the CAWS and UDIP are inadequate to support a diverse and healthy aquatic environment. The preponderance of silt, insufficient amounts of hard substrates such as cobble and boulder, minimal instream cover, lack of riffles, and lack of fast water are all responsible for the limited quality of the aquatic life that can be supported. The excessive amounts of silt alone cause a whole host of adverse consequences for fish, including preventing adequate exchange of oxygen, filling interstitial spaces that fish and desirable aquatic insects could otherwise use and excessive turbidity that adversely affects desirable sight-feeding fish species. The widespread accumulation of silt is an

unavoidable result of the protected navigational and flood control purposes of the CSSC, Brandon Pool and UDIP. The presence of the locks and dams, and their use to artificially maintain a near constant water level, causes the silt to settle out on a continuous basis. In several areas of the UDIP, the silt is so thick that it was the only substrate found during a July 2008 habitat survey.[8]

The critical elements for attainment of CWA goals are plainly absent from these waters. There is not a variety of habitats, let alone a sufficient amount of habitat variety, to support diverse and balanced fish populations. Expert witnesses have repeatedly testified and documented that the habitat is either poor or of very limited quality. The South Branch, the CSSC and Brandon Pool all have very poor quality habitat. The UDIP habitat quality, while better, is still generally poor quality habitat with the one exception of the very limited area of the Brandon Tailwater. But even though that area has some natural features, making it a marginally "good" habitat, the UDIP still suffers from the lack of adequate fast water flow and no riffles that better quality fish need to establish stable populations. The minimal clean hard substrates (*e.g.*, gravel, cobble and rubble), sparse cover, contaminated sediments, and minimal spawning areas in the UDIP all contribute to the poor quality of its habitat. The considerable and rapid fluctuation in water levels and stream flows in the UDIP for flood control purposes only further exacerbates the poor conditions it provides for aquatic life.

Among the many expert witness reports presented to the Board on habitat and aquatic community issues, EA Engineering's work on these issues stands out because of its continual, extensive study of the UDIP over the course of many years. The QHEI scores developed by EA Engineering and included in the Lower Des Plaines River UAA Report support the conclusion

[8] Ex. 2, p. 30 of Ex. 366: EA Engineering, Science, and Technology's Report on the Aquatic Life Use Attainability Analysis for the South Branch of the Chicago River, the Chicago Sanitary and Ship Canal, and the Upper Dresden Island Pool, September 2008

that the UDIP cannot attain the Agency's proposed aquatic life use designation. Most of the QHEI scores in the UDIP were below the level considered "good" habitat, with many areas incapable of supporting healthy fish communities. Further, in the most recent 2008 QHEI survey for the entire UDIP, the mean QHEI value of 47 is significantly below the QHEI value of 60 that experts agree can support a fish community consistent with CWA goals. The 2008 QHEI survey was the most representative survey of any produced in this rulemaking. It covered the entire UDIP, scoring 50 different locations or "reaches" of the UDIP. In contrast, the QHEI survey that the Agency relied upon to support its aquatic life use designation for the UDIP was far more limited, with scoring performed for only three reaches of the UDIP.

The record here is based on almost twenty years and thousands of fish collections and identifications to assess the quality and quantity of the resident fish population. Consistently, the fish communities are characterized by low abundance of most native species (except for a few tolerant ones), low species richness, and domination by highly tolerant species. Intolerant species are "essentially absent" in the UDIP.[9] The UDIP cannot and will not support habitat specialists, many of which are tolerant, despite proposed changes to water quality standards.[10] Because there is not today, and will not be in the foreseeable future, sufficient habitat that can support a balanced fish population, the CWA goals simply cannot be attained. The existing tolerant fish community is what the UDIP is capable of supporting - - not more and not less.

Remediation of the prevalent conditions that limit attainment of a higher use is clearly not feasible. Taking first the main limiting factor, which is their impounded nature; any significant improvement can only be achieved by removing or modifying the locks and dams now present. Doing so is neither required by the Clean Water Act nor practical to achieve. It would be

[9] 11/9/09 PM Tr. at 35
[10] Ex. 366, Pre-filed Testimony of Gregory Seegert, at 12

contrary to the Clean Water Act's protection of an existing navigational use, one of the main purposes of the waterway. Another major limiting factor is the waterway's use to convey the Chicago area's wastewater and stormwater runoff. There is no feasible alternative for wastewater conveyance. For combined sewer overflows, even when the Tunnel and Reservoir Plan ("TARP") is completed in the late 2020's, the evidence shows there will still be CSO events, particularly in the UDIP which is beyond the TARP area. Unless the locks and dams are removed, and the urbanized nature of the area significantly changed, the accumulation of silt, much of it contaminated, also continues. Even if feasible, the cost of remediation to remove these sediments or even treat the contaminated sediments (and to continue to do so into the future) is prohibitive. In sum, the poor habitat and other stressors limiting the UDIP are fixed and irreversible.

As noted above, MWGen does not oppose the level of use designation the Agency proposes for the South Branch of the Chicago River, the CSSC and Brandon Pool. Prior to the recently announced tentative agreement between the Metropolitan Water Reclamation District of Greater Chicago (the "District") and certain environmental groups (collectively referred to as the "Negotiating Parties", the District also had proposed a comparable use designation for these waters. Unquestionably, aquatic life use designations should not be determined by compromises struck as part of an agreement between interested parties. The Illinois EPA has gone on record as being opposed to this aspect of the Negotiating Parties' tentative agreement because "no new scientific information" was presented to support it, as well as noting its potential adverse impact upon MWGen whose Fisk Station discharges to this CAWS segment.[11] Although the District is apparently now willing to compromise its position on the applicable aquatic life use designation

[11] Reply of the Illinois Environmental Protection Agency to Responses of Midwest Generation, ExxonMobil, Stepan and Illinois Environmental Regulatory Group to Updated Joint Status Report, dated January 30, 2012, at p. 5

for the South Branch of the Chicago River, its previously presented extensive evidence in its Habitat Evaluation Report prepared by LimnoTech and accompanying expert testimony which showed that both the South Branch Chicago River and the CSSC had the lowest quality of habitat for fish among the major reaches in the CAWS.[12] Further, in his pre-filed testimony reviewing the Habitat Evaluation Report, Dr. David Thomas, a witness for the Environmental Groups, agreed that this study was "a very extensive examination of the habitat provided in the [CAWS] and also agreed with that its habitat metrics were "probably superior."[13] Dr. Thomas did not take issue with the proposed aquatic life use designation for the South Branch of the Chicago River. There is simply no defensible basis for proposing a different aquatic life use designation for the South Branch of the Chicago River than for the CSSC.

For the UDIP, because the impounded nature of a waterbody has such a significant effect on the aquatic life uses that it can attain, a use classification description that recognizes the "impounded" attribute of the UDIP will serve as a reliable and helpful tool in crafting a scientifically sound use designation for the UDIP. An appropriate use designation for the UDIP should recognize its modified nature, widespread siltation that significantly impair habitat, and the fact that its main limiting factor is its impounded condition. Accordingly, MWGen submits that the Board should adopt a proposed use designation that includes language which captures both of these key attributes of the UDIP, similar to the Ohio EPA's Modified Warmwater Use – Impounded designation, as set forth above and more fully discussed below. For ease of reference, MWGen has attached as Exhibit A a proposed rule for the UDIP aquatic life use designation for the Board's consideration.

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[12] *See, e.g.*, District's Habitat Evaluation Report at Public Comment 284; Bell Testimony, 5/16/11 Tr. at 192
[13] Pre-filed Testimony of David Thomas, Ex. 473 at p. 1

III. MWGen's CAWS and Lower Des Plaines River Electric Generating Stations

MWGen is an independent power producer that operates seven electric generating stations in Illinois.[14] The proposed aquatic life use designations will directly affect several of MWGen's electric generating stations. Five MWGen stations discharge into the CAWS or the Lower Des Plaines River ("LDR"). The MWGen Stations are coal-fired and utilize an open cycle, once-through condenser cooling system that requires the use of large volumes of surface water.[15] Water enters the plants, is circulated through the station's condensers to cool steam produced by the electric generating process, and then is discharged at a higher temperature back into the receiving water.[16] The Fisk, Crawford, and Will County stations are located on the CAWS. The Fisk station discharges into the South Branch of the Chicago River upstream of Bubbly Creek, and both the Crawford and Will County stations discharge into the CSSC.[17] Midwest Generation has recently announced that it will close the Fisk Station on or before December 31, 2012 and the Crawford Station on or before December 31, 2014. The two MWGen Lower Des Plaines River facilities, Joliet 9 and Joliet 29, discharge to the UDIP.[18] The five facilities employ over 600 individuals and have a combined generating capacity of a little over 3,100 gross megawatts of electricity.[19]

One of the five MWGen stations has cooling towers. Joliet 29 (Units 7&8) has open-cycle, non-recirculating cooling towers which were voluntarily installed in 1999.[20] The towers are used on an as-needed basis and run an average of about 46 days per year. They are "helper cooling towers" which are not designed for long-term continuous runs, and are capable of

[14] Exhibit 364, Pre-filed Testimony of Julia Wozniak at 2
[15] Ex. 364 at 2
[16] Ex. 364 at 2-3
[17] 11/9/09 AM Tr. at 11
[18] The Joliet Stations are sometimes referred to by their unit numbers. Joliet 9 is the same as "Joliet Unit 6" and Joliet 29 is the same as "Joliet Units 7 & 8." Ex. 364 at 2-3
[19] Ex. 364 at 2
[20] Ex. 364 at 4

cooling approximately one-third of Joliet 29's total design discharge.[21] The helper cooling towers minimize the potential thermal impacts on the river, maintain compliance with applicable thermal water quality standards, and optimize MWGen's ability to produce power during critical weather conditions, such as the during hot summers when demand is at its peak.[22] MWGen presented an extensive expert report and supporting testimony by Sargent & Lundy which shows that if both the Agency's proposed use designations and proposed thermal water quality standards are adopted, MWGen would have to install closed-cycle cooling systems at each of these five stations at a cost approaching $1 billion, of which the two Joliet Stations and the Will County Station account for approximately $672 million. MWGen maintains that such exorbitant compliance costs are not justified or economically reasonable within the meaning of section 27 of the Illinois Environmental Protection Act, based on the evidence presented in this rule-making to date.

IV. Legal Overview

A. "Designated Uses" under the Clean Water Act

The CWA empowers the states to define water uses and to set criteria to protect these uses.[23] The uses and criteria constitute "standards" that are to ensure that the goals articulated in the CWA are met. 33 U.S.C. § 1313(c). "Such standards shall be established taking into consideration their use and value for public water supplies, propagation of fish and wildlife, recreation purposes, and agricultural, industrial, and other purposes."[24] Hence, a use designation is one component of a water quality standard. As the U.S. EPA has stated, "[t]he 'use' of a waterbody is the most fundamental articulation of its role in the aquatic and human

[21] Ex. 364 at 4
[22] Ex. 364 at 4
[23] *Mississippi v. Costle*, 625 F.2d 1269 (5th Cir. 1980)
[24] Sec. §303(c) of the CWA, 33 U.S.C. §1313(c); 40 CFR § 131.10 describes the regulatory requirements related to designated uses.

environments, and all of the water quality protections established by the CWA follow from the waters designated use."[25]

Section 101(a)(2) of the CWA sets forth the "...national goal that wherever attainable...water quality...provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water."[26] This is commonly called the "fishable/swimmable use designation." Hence, while the CWA's stated preference is that waters be designated as fishable/swimmable, it also clearly states that this preference is conditioned upon such uses being "attainable." Congress recognized that the achievement of "fishable" aquatic life uses will not always be possible. Accordingly, where fishable/swimmable uses are not "attainable" in a particular water body, states are authorized to designate lower uses for water bodies that are unable to attain the CWA goals.

The presumption that a waterbody can attain the fishable/swimmable goal is a rebuttable presumption.[27] The U.S. Supreme Court has stated, "[t]he word 'rebuttable' means that the presumption is not conclusive."[28] In other words, it may be overcome by the introduction of contrary evidence.[29] As more poetically explained, "presumptions may be looked on as the bats of the law, flitting in the twilight, but disappearing in the sunshine of actual facts."[30] Viewed in the light of the actual facts here, the "fishable" presumption has been rebutted for both the UDIP and the CAWS segments on which MWGen's stations are located. Because relevant evidence

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[25] Advanced Notice of Proposed Rulemaking, 63 Fed.Reg. 36742, 36749 (July 7, 1998)
[26] Sec. §101(a)(2) of the CWA, 33 U.S.C. §1251(a)(2)
[27] *Idaho Mining Assoc., Inc. v. Browner*, 90 F.Supp. 2d 1078, 1092 (D.Idaho, 2000)
[28] *John R. Sand & Gravel Co. v. U.S.*, 552 U.S.130, 137, 128 S.Ct. 750 (2008) (Supreme Court found that a previous decisions created a rebuttable presumption of equitable tolling of Government-related statute of limitations, but a definitive earlier interpretation of the limitations statute was a sufficient rebuttal)
[29] The effect of a presumption of law is that the trier of fact is compelled to reach a conclusion in the absence of evidence to the contrary from the opponent; however, if the opponent offers evidence to the contrary, the presumption disappears as a rule of law, and the case is in the trier of fact's hands free from any rule. *Legille v. Dann*, 544 F.2d 1, 5-6 (D.C. Cir., 1976)
[30] *Legille v. Dann*, 544 F.2d 1, 6 (D.C. Cir., 1976)

contrary to the presumption that these waterbodies are capable of attaining the CWA aquatic life use goals has been presented, the presumption no longer applies. Nor does this rebuttable presumption shift the burden of persuasion. The party who initially had the benefit of the presumption (*i.e.*, the Illinois EPA) retains the burden to demonstrate that the waterbody is capable of attaining the CWA aquatic life goals.[31] For the UDIP, the Illinois EPA has not met this burden.

The CWA implementing regulations state that "[a]t a minimum, uses are deemed attainable if they can be achieved by the imposition of effluent limits required under sections 301(b) and 306 of the Act [i.e., the technology-based controls of the CWA] and cost-effective and reasonable best management practices for nonpoint source control. 40 CFR § 131.10(d). The Illinois EPA agrees that under this regulatory standard, the subject CAWS segments cannot attain a higher use that achieves the CWA's goal. While the Illinois EPA contends that the UDIP can "minimally" do so, it has not carried its burden to show that point source effluent limits or best management practices for nonpoint source control in the UDIP will make its proposed UDIP use attainable. It has provided no explanation of how such controls will succeed in overcoming the physical and biological constraints on aquatic life imposed by the impounded and modified nature of the UDIP.

In setting use designations, the States are required to protect "existing uses." 40 CFR §§ 131.10 (g) and (h) and 131.12. "Existing uses" are defined as "those uses actually attained in the water body on or after November 18, 1975, whether or not they are included in the water quality standards." There is no dispute here that the navigational, urban drainage and flood control uses

[31] *In re G-I Holdings, Inc.*, 385 F.3d 313, 318 (3rd Cir., 2004), *Franciscan Sisters Health Care Corp v. Dean*, 95 Ill.2d 452, 462, 448 N.E.2d 872, 876 (Ill. 1983)

are existing uses. As the Agency admitted in its Subdocket A Post-Hearing Comments, citing to the Pre-Filed Testimony of Ron Sulski (Ex. 1 at pp. 3-4):[32]

> The system still must support other critical functions, particularly urban drainage, flood control and navigation. Its potential continues to be somewhat tempered by its unique physical and habitat characteristics as well as lingering, albeit diminishing, legacy contamination from prior decades of neglect.

Midwest Generation's proposed UDIP aquatic life use designation expressly recognizes these existing uses so that it is clear that they are among the designated uses to be protected.

B. Use Attainability Analysis (UAA)

As defined in 40 CFR §131.3(g), a UAA "is a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological and economic factors as described in § 131.10(g)." If the CWA fishable goal is not attainable, the UAA defines the attainable use for each water body. A UAA evaluates how each of the six UAA factors in 40 CFR §131.10(g) prevent attainment of the CWA goal of fishable/ swimmable. If the UAA shows that the fishable/swimmable use is unattainable, then a State may designate uses that do not include the uses specified in § 101(a)(2) of the CWA.[33] The UAA regulation identifies six factors that encapsulate the type of evidence that may be presented to rebut the fishable/swimmable presumption in the CWA. The six factors are:

1) UAA Factor 1: Naturally occurring pollutant concentrations prevent the attainment of the use; or

2) UAA Factor 2: Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use…; or

[32] "Post-Hearing Comments of the Illinois Environmental Protection Agency", R08-09(Sub-Docket A), dated April 1, 2010, at p. 21

[33] *Idaho Mining Assoc., Inc. v. Browner*, 90 F.Supp. 2d 1078, 1100 (D.Idaho, 2000); 33 U.S.C. § 1251(a)(2)

3) UAA Factor 3: Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

4) UAA Factor 4: Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or

5) UAA Factor 5: Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

6) UAA Factor 6: Controls more stringent than those required by Sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact[34]

For the CAWS and the Lower Des Plaines River, UAAs were conducted primarily to determine whether or not the existing use designation should be retained or upgraded and if so, to what higher attainable use. As the U.S. EPA has stated in a 2006 Memorandum to Regional Water Division Directors, "[a] credible UAA can lead to refinements or changes in use that lead to either more or less protective criteria. The goal is that the new use is more accurate."[35]

[34] 40 CFR. §131.10(g)
[35] Memorandum of March 15, 2006, from Ephraim King, Director of the Office of Science and Technology, Division of Water, to the Regional Water Division Directors, U.S. EPA

C. Existing and Proposed Aquatic Life Use Designations for the CAWS and Lower Des Plaines River

The existing Illinois aquatic life use classification system is limited to a few, non-specific use categories. It is composed of essentially two classifications: General Use and Secondary Contact and Indigenous Aquatic Life Use.[36] General Use Waters are those water bodies that can attain the CWA aquatic life goals. Waters designated as Secondary Contact and Indigenous Aquatic Life Uses are not able to attain the CWA fishable/swimmable goal. The Chicago Area Waterway System and the Lower Des Plaines River are currently classified as Secondary Contact and Indigenous Aquatic Life Waters.[37] On October 26, 2007, Illinois EPA filed its Statement of Reasons proposing three new aquatic life use classifications for these waters. They are:

A) The Chicago Area Waterway System Aquatic Life Use A Waters ("ALU A"), which include the North Shore Channel, the North Branch of the Chicago River, parts of the Calumet River, Lake Calumet, and the Calumet-Sag Channel;

B) The Chicago Area Waterway System and Brandon Pool Aquatic Life Use B Waters ("ALU B"), which include the Chicago River, the North and South Branch of the Chicago River, the Chicago Sanitary and Ship Canal, the Calumet River, Lake Calumet Connecting channel and Brandon Pool (i.e., the segment of the Lower Des Plaines River from its confluence with the CSSC to the Brandon Road Lock and Dam); and

C) The Upper Dresden Island Pool Aquatic Life Use Waters, ("UDIP ALU"), which is the Lower Des Plaines River from the Brandon Road Lock and Dam to the Interstate 55 bridge ("I-55 Bridge").

The ALU A and B proposed aquatic life use designations are considered lower designated uses than the CWA "fishable" goals. In its Statement of Reasons, the Illinois EPA stated that ALU A and ALU B waters are unable to attain the CWA goals because of three of the UAA Factors: UAA Factor 3 (Human caused conditions or sources of pollution); UAA Factor 4

[36] 35 Ill. Adm. Code §§ 303.201, 303.204
[37] 35 Ill. Adm. Code § 303.204

(Dams, diversion or other types of hydrological modifications) and UAA Factor 5 (Physical conditions related to the natural features of the waterbody).[38]

According to the Agency, the proposed UDIP ALU is intended to mean that this portion of the Lower Des Plaines River is capable of "minimally" meeting the CWA "fishable" goals even though the aquatic life was not achieving the biological potential expected in waters with fair habitat.[39] Even though waters with "fair habitat" would only be expected to support a non-attaining fish community, the Agency nevertheless defined the UDIP ALU use designation as follows:

> These waters are capable of maintaining aquatic life populations consisting of individuals of tolerant, intermediately tolerant and intolerant types that are adaptive to the unique flow conditions necessary to maintain navigational use and upstream flood control functions of the waterway system.

Importantly, although the Agency found that the aquatic life use attainability of both the Lower Des Plaines River and the CAWS "depend primarily on physical habitat conditions" and that those habitat conditions are "unique,"[40] the proposed UDIP ALU omits any mention of the habitat conditions that make it allegedly capable of "minimally" attaining the CWA "fishable" goal. Both the Agency's proposed UDIP ALU, as well as how it arrived at the determination that it is appropriate for the UDIP, are vague and incomplete. The Agency, through one of its witnesses (Roy Smogor of Illinois EPA), could only generally describe the meaning and intent of the proposed UDIP ALU as follows:, "the proposed aquatic life use for [UDIP] is not the same as general use, that's not the same as saying it can't attain the [CWA] aquatic life goal. There are

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[38] Illinois EPA Statement of Reasons, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304,* R08-09, October 26, 2007, pp. 47-48

[39] Illinois EPA Statement of Reasons, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09, Oct. 26, 2007, p. 52

[40] Illinois EPA Statement of Reasons, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09, Oct. 26, 2007, p. 47

various levels of attainment once you're above that goal, so it's quite possible that "general use" could be interpreted as a higher level of attainment than the proposed aquatic life use for [UDIP], and of both of (sic) them represent something that meets the [CWA] aquatic life goal."[41] He concluded that the proposed UDIP ALU is a little above the goal, and the general use is a little bit higher than that.[42]

Even after all of the testimony in this proceeding, it is still less than clear how the Illinois EPA determined that none of the six UAA Factors applied to the UDIP and why it concluded it was capable of "minimally" attaining the CWA's goals, whatever "minimally" means. What is clear, however, is that in reaching its determination, the Illinois EPA relied upon findings and conclusions that were flawed because it failed to adequately consider all of the relevant evidence and misinterpreted other evidence that it did consider. The evidence showing that the UDIP is not capable of attaining the CWA's fishable goal is analyzed in detail below. It shows that the locks and dams in both the UDIP and the CAWS irreversibly impair the waterways' abilities to support habitats that are essential to provide for the protection and propagation of a balanced aquatic community. Also, other related and equally detrimental conditions that derive from the locks and dams, including barge traffic, sediments, contaminated sediments, nutrients, siltation, reduced habitat diversity, and the overall urbanized nature of the area surrounding the waterways, are all evidence contrary to the presumption that the waterways are capable of attaining the CWA aquatic life use goals. The Illinois EPA admitted in its Statement of Reasons that the UDIP is constantly subjected to impacts from navigational use and upstream flood control functions.[43] Yet, the Illinois EPA failed to consider all of the resulting, negative effects of this navigational use and upstream flood control functions. If it had, there is no way Illinois

[41] 1/28/08 Tr. at 243-242
[42] 1/28/08 Tr. at 244
[43] Illinois EPA Statement of Reasons at p. 51

EPA would have proposed that the UDIP could attain the CWA aquatic life use goals, even minimally.

V. The Affected Water System

For over a century, the CAWS and the LDR have been heavily used for industrial and commercial shipping. The CSSC portion of the CAWS and LDR are part of the Upper Illinois Waterway, one of the busiest inland commercial navigational systems in the nation connecting the Great Lakes and the St. Lawrence Seaway to the Mississippi River.[44] Indeed, 16 million tons of commodities moved through the CSSC with 12.4 million tons of cargo moving just through the Lockport Lock.[45] The waterways have been altered and managed, including reversing the flow of the river, to promote commercial navigation and to move wastewater and stormwater from Chicago and away from Lake Michigan.[46]

As recognized by both the Illinois EPA and the Board, when the Secondary Contact Use and Indigenous Aquatic Life Use ("Secondary Contact Use") was formulated in the 1970's, the Board identified six characteristics of the CAWS and LDR that made the waterway unable to attain the CWA Goals.[47] Those characteristics included: routinely dredged and maintained channels, significant sludge deposition as a result of CSOs, industrial waste discharge and urban runoff, minimum slope and low velocity in flow, urban stress within the entire drainage area,

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[44] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09, at 48, citing UAA Report (Attachment A at 1-8

[45] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304,* at 20, citing PC #499 at 3

[46] In this regard, the CSSC may be viewed as part of a "treatment works" under Illinois law. See 35 Ill. Adm. Code § 301.415. In another Board rule-making proceeding, the Illinois EPA stated: "Pursuant to 35 Ill. Adm. Code 301.415, channels dug to convey effluents are considered treatment works." See, *In the Matter of Proposed Amendments to 35 Ill. Adm. Code 302.102(b)(6), 302.102(b)(8), 302.102(b)(10), 302.208(g), 309.103(c)(3), 405.109(b)(2)(A), 405.109(b)(2)(B), 406.100(d)*, R07-09, Illinois EPA's Responses to Pre-Filed Questions of ELPC, Prairie Rivers Network, and Sierra Club, April 19, 2007, p. 1

[47] Illinois EPA Statement of Reasons, at 19-20 and Opinion and Order, First Notice in Subdocket B, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304* at. 10

nonexistent good physical habitat due to commercial and recreational watercraft uses, and the massive wastewater load including the CSO discharges[48].

Years later in its 1996 decision in the Commonwealth Edison Adjusted Standard proceeding, AS96-10, the Board again found that the area was "heavily developed with industries," "very artificial," "significantly modified," and "limited in terms of habitat.[49] With regard to the presence of extensive sedimentation, the Board found that "[h]istorical practices have caused substantial residual chemical contamination to be present in the sediments of the waterway."[50] For most of these adverse conditions, the Illinois EPA does not dispute that they continue to exist today in the CSSC and the UDIP.[51] The sole exception being the Illinois EPA's unsupported contention that the stress on the aquatic community caused by the significant sediment deposits, including their adverse impacts on physical habitat, have decreased because of improvements in wastewater treatment and TARP.[52] As will be addressed in detail later in these comments, the relevant evidence shows that there has been no significant improvement in the extent or nature of the sedimentation present in the CSSC or the LDR.

The flow from the South Branch of the Chicago River through the LDR continues to be dominated by wastewater effluent, with even more effluent discharged into the system since the

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[48] *Id.*

[49] *In the Matter of: Petition of Commonwealth Edison Company For Adjusted Standard From 35 Ill. Adm. Code 302.211(d) and (e),* AS 96-10, October 3, 1996 at 6. In the AS96-10 proceeding, the Board adopted an adjusted thermal water quality standard applicable at the I-55 Bridge which covered all of the MWGen stations. The I-55 Adjusted Thermal Standards have been incorporated into each of the NPDES permits issued to the MWGen stations. Ex. 364 at 7. The thermal adjusted standards consist of a set of in-stream monthly/semi-monthly temperature limits which vary on a seasonable basis. Ex. 364 at 5 & 7. The I-55 Adjusted Standards provide a more representative normal, seasonal fluctuation than either the Secondary Contact or General Use numeric standards. Ex. 364 at 8. They were designed to complement the Secondary Contact thermal water quality standards upstream and provide a needed transition zone from Secondary Contact to General Use waters. Ex. 364 at 8-9

[50] *In the Matter of: Petition of Commonwealth Edison Company For Adjusted Standard From 35 Ill. Adm. Code 302.211(d) and (e),* AS 96-10, October 3, 1996 at 6

[51] 1/28/08 Tr. at 181-182

[52] 1/28/08 Tr. at 181-182

Secondary Contact Use was initially adopted.[53] The velocity of the flow is generally very slow and the flow itself is unpredictable, without following any type of normal trend, because of the controls on the river. The flow can fluctuate dramatically, by thousands of cubic feet per second over several hours or less, and is largely dictated by upstream wastewater effluents, as well as storm events and ensuing flood control measures implemented by the Corps.[54] By no means is this a naturally flowing river system.

The CAWS UAA Report correctly stated that the "century old and well functioning and managed system of the [CSSC]…must be considered for the foreseeable future as an irreversible reality."[55] The routinely dredged and maintained channels, industrial waste discharge, urban runoff and low velocity, are all negative characteristics that have not changed since the original Secondary Contact Use designation was assigned to these waters, nor likely will change in the future.

The same is true of the two LDR segments included in this rule-making: the Brandon Road Pool and what the Agency has named the "Upper Dresden Island Pool" or "UDIP,", which extends from the Brandon Lock and Dam to the I-55 Bridge. The Brandon Road Pool is a four-mile man-made channel that is bordered on the sides by masonry, concrete or sheet pile embankment.[56] "The entire waterway is completely channelized to a minimum depth of nine

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[53] 3/10/08 PM Tr. at 21

[54] Ex. 364 at 10. The Corps maintains water flow control records for the CAWS and UDIP. These records are available on its website at: http://www2.mvr.usace.army.mil/WaterControl/new/layout.cfm (last checked 2/21/12). Graphical examples of the historical frequency and extent of the water level fluctuations at the Lockport Pool on the CSSC for the period from January 1, 2009 through December 31, 2011 from the Corps' website are attached as Exhibit B. The same information for the Des Plaines River at Ruby Street Bridge at Joliet, IL (2.7 miles upstream of the Brandon Road Lock and Dam) and for the Brandon Road Lock and Dam is also included in Exhibit B. The frequency of the changes in water levels at these locations depicted in these graphs provides a accurate overview of how often the flow fluctuates in the CSSC and the UDIP.

[55] Attachment A to Illinois EPA Statement of Reasons, UAA Report, at.2-22

[56] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09 at 48

feet and is used mostly for transport of bulk commodities."[57] It serves as a major shipping lane that occupies the entire width of the pool.[58] The entire Dresden Island Pool extends 14 miles from the Brandon Lock and Dam to the Dresden Island Lock and Dam on the Illinois River.[59] The UDIP portion is approximately 8.1 miles long.[60] The entire length of the UDIP also is channelized to a minimum depth of 9 feet and is primarily used for commercial transport of bulk commodities such as grain, coal, petroleum products, chemicals and raw materials.[61] The UDIP includes a small area, known as the Brandon Tailwater, which accounts for only 7% of the entire Dresden Pool. Even the Illinois EPA agrees that the Brandon Tailwater is not typical of the UDIP habitat quality.[62] The Brandon Tailwater may have better habitat for aquatic species than the rest of the UDIP, but it is a small, isolated, and shallow areas that is entirely surrounded by the rest of the UDIP.[63] These conditions, together with toxic sediments and the adverse aquatic

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[57] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09 at 49

[58] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09 at 49

[59] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09 at 49

[60] IEPA Statement of Reasons at p. 17. Because the remaining portion of the Dresden Island Pool from the I-55 Bridge to the Dresden Island Lock and Dam is approximately five-miles long, it is commonly referred to as the "Five-Mile Stretch."

[61] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09 at 49

[62] 3/11/08 Tr. at 48; Ex. 2 of Ex. 366 EA Engineering, Science, and Technology's Report on the Aquatic Life Use Attainability Analysis for the South Branch of the Chicago River, the Chicago Sanitary and Ship Canal, and the Upper Dresden Island Pool, September 2008 at 27

[63] Ex. 366, Pre-filed Testimony of Gregory Seegert, at 11. In its technical guidance document on biological criteria for streams and small rivers, the U.S. EPA states that "habitat-sensitive species may be reduced or destroyed in stream basins with extensive degraded conditions, even if short stretches of good habitat exist." U.S. EPA, *Biological Criteria: Technical Guidance for Streams and Small River*",, Revised Edition, 1996, Chapter 5 "Habitat Structure" at p. 81, available at: http://www.epa.gov/bioiweb1/pdf/EPA-822-B-96-001BiologicalCriteria-TechnicalGuidanceforStreamsandSmallRivers-revisededition1996.pdf

life effects of the erratic flow fluctuations that occur in the UIDP, are insufficient to support a balanced, diverse aquatic community.[64]

In reaching its finding that the UDIP is capable of "minimally" attaining the CWA aquatic life goals, the Illinois EPA appears to have relied in part on the chemical quality of the UDIP surface waters, stating that the UDIP is meeting every parameter under the General Use standards, except for dissolved oxygen and temperature.[65] But for waters like these, it is not the water chemistry of a waterbody that dictates the aquatic life use it can attain. The U.S. EPA has acknowledged that "for some sites, water quality, alone, may be an insufficient basis for making an existing use finding if there are other factors that would prohibit the use from taking place regardless of the quality of the water at a site."[66]

The UDIP has significant impairments and stressors, including degraded habitat, contaminated sediments, metals, nutrients, excessive turbidity, synthetic organics such as pesticides and PAHs, pharmaceuticals and personal care products, barge traffic and flow regime alteration.[67] There are over 800 identified causes and sources of impairments for all of the stretches of the Des Plaines River, but the most common and relevant to both segments of the LDR, are municipal point source discharges, CSOs, urban runoff/storm sewers, contaminated sediments, channelization, flow regulation, hydro-modification, and habitat alteration.[68] The effluent discharges from the upstream wastewater reclamation plants are almost 90% of the flow

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[64] Ex. 366 pp. 3, 10
[65] 3/11/08 Tr. at 45. However, in reaching this conclusion, the Illinois EPA conceded that it did not consider any criteria derived under the Illinois Subpart F Water Quality Standards Regulations, 35 Ill. Adm. Code 302.601 *et seq.*, even though Subpart F would apply to the UDIP under the proposed rules. Illinois EPA does not know how many of the chemicals for which Subpart F criteria exist are met in the UDIP. Thus, the Agency's review of the chemical water quality of the UDIP was incomplete, including whether and to what extent UDIP dischargers will be subject to Subpart F criteria and the extent of any resulting additional treatment requirements they will face.
[66] U.S. EPA Advance Notice of Proposed Rulemaking, 63 FR 36742, 36753 (July 7, 1998)
[67] Ex. 369 at 4
[68] Ex. 369 at 3

and during the winter almost the entire low flow is made of effluent discharges.[69] Thus, the LDR is properly characterized as an effluent dominated stream.[70] All of these conditions translate into a system that is unable to support a healthy and diverse aquatic habitat. In no way can the UDIP attain, even "minimally" so, the CWA aquatic life goals as the Illinois EPA suggests, for it is and will always be a channelized, effluent dominated stream with extensive sedimentation, that is primarily used for commercial navigation and lacks the necessary habitat quality and diversity to support the balanced, diverse aquatic life necessary to attain the CWA aquatic life use goal.

VI. The UDIP Cannot Attain the CWA Aquatic Life Use Goals

Illinois EPA has proposed to designate the South Branch of the Chicago River, the CSSC and Brandon Road Pool as ALU B Waters based on UAA Factors 3, 4 and 5. MWGen agrees that all three of these UAA Factors apply to these portions of the CAWS. The CSSC and the Brandon Road Pool are almost entirely impounded and controlled via locks and dams. The impounded and flow-controlled nature of these water segments satisfies UAA Factor 4 and also contributes to the applicability of UAA Factors 3 and 5. The Board already has found that "flow conditions in the South Branch of the Chicago River are affected by draw downs to accommodate anticipated storm flow in the CAWS."[71] Further, the Board also has concluded that both the Upper and Lower CSSC satisfy UAA Factor 3.[72] For the Upper CSSC, the Board cited the "significant impacts due to human caused conditions and sources of pollution",

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[69] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09 at 48 and Attachment A, UAA Report, at 1-8

[70] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09 at 48 and Attachment A, UAA Report, at 1-8

[71] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304,* R08-09 at 38

[72] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304,* R08-09 at 42

including "steep banks, vertical dock walls, power boating and commercial barge traffic" as being among the irreversible conditions in the foreseeable future.[73] For the Lower CSSC, the Board found that both UAA Factors 3 and 4 were satisfied based on the "severely impacted by hydrologic modification, physical barriers and unique anthropogenic features", including the deep-draft vertical-walled shipping canals, the Lockport Lock and Dam, and the electrified Invasive Species Dispersal Barrier.[74] Similarly, the Board found that UAA Factors 3 and 4 applied to the Brandon Road Pool because it is also "significantly impacted by human caused conditions and sources of pollution along with hydrologic modifications", specifically noting "the vertical sheet pile and concrete embankment couples with commercial navigation traffic limits."[75] The Board further found that the Brandon Road Pool "is also affected by rapid changes in flow velocity and depth during storm events."[76] MWGen supports each of these findings.

However, MWGen strongly disagrees with the Agency's finding that the UDIP is "minimally" capable of maintaining the CWA goals. The UDIP is a continuation of, not a sharp break from, the same existing uses and constraints present in the CSSC and Brandon Pool proposed ALU B waters. The UDIP is effluent dominated. It is channelized and impounded. Its channelized conditions is maintained by dredging to allow its continued and protected, existing use for commercial navigation. Its flow is controlled to prevent flooding and in further support

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[73] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304,* R08-09 at 42

[74] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304,* R08-09 at 42

[75] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304,* R08-09 at 49

[76] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304,* R08-09 at 49

of its existing use for commercial navigation. It has extensive siltation and sedimentation, much of it contaminated. As the LDR UAA Report recognized, "[t]here is no doubt that the high contamination of sediments in the depositional zones, is caused by impounding the river for navigation."[77] It does not have free-flowing waters, riffle areas or other habitat conditions sufficient to support a balanced, diverse aquatic community. The small Brandon Tailwater area, which offers at best about 7% of suitable aquatic habitat in the entire Dresden Pool, is not sufficient to support a balanced, diverse aquatic population that equates to the attainment of the CWA goal. In 1996, the Board concluded that the LDR, including the UDIP area, "is a very artificial and significantly modified waterway that is limited in terms of habitat."[78] Nothing has been presented in this rule-making to show that these conditions have changed since 1996. The habitat limitations the Board acknowledged in 1996 still exist today and continue to prevent the UDIP from attaining the higher aquatic life use proposed by the Agency.

As more fully described below, the Board should not adopt the Agency's proposed UDIP use designation. Instead, the proper finding supported by the evidence in this rule-making is that the UDIP is not capable of attaining the aquatic life use goal of the CWA and its use designation, as proposed by MWGen in Exhibit A hereto, should recognize the characteristics of this water body that prevent it from doing so: its impounded and channelized nature; the flow management regime that provides flood control and supports its navigational use; the presence of extensive sedimentation and the lack of suitable habitat to support a balanced, diverse aquatic community.[79] Further discussion of the appropriate use classification for the UDIP follows the UAA Factors discussion below.

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[77] Attachment A, UAA Report, December 2003, p. 3-42
[78] *In the Matter of: Petition of Commonwealth Edison Company For Adjusted Standard From 35 Ill. Adm. Code 302.211(d) and (e),* AS 96-10, October 3, 1996 at 6
[79] Ex. 2 of Ex. 366 at 33

A. UAA Factor 4 is Satisfied Because Impairments Do Not Allow the UDIP to Attain the CWA Aquatic Life Use Goals

The dams and other hydrologic modifications and controls in the UDIP prevent the establishment of the kind of habitat necessary to support the propagation and protection of fish. The operation of the locks and dams in the UDIP and the resulting consequences, including low to no flow, sudden and significant flow fluctuations, extensive sedimentation, and habitat degradation, clearly satisfy the elements of UAA Factor 4.[80] In Subdocket A, the Board has already found that all of these conditions were irreversible in the foreseeable future.[81] The UDIP shares most of the characteristics of the CSSC and Brandon Road Pool, including effluent-dominated flow, a highly impounded condition due to the locks and dams, extensive sedimentation, habitat degradation, and extreme and sudden changes in water depths and velocity for flood control purposes.[82] For all of these reasons, the proposed UDIP ALU is not attainable under UAA Factor 4.

1. The Presence and Adverse Effects of Locks and Dams in the UDIP Satisfy UAA Factor 4

In its testimony, the Illinois EPA agreed that impoundments are a stressor on aquatic life that reduces biological integrity.[83] The Agency's witnesses do not dispute that there are dams on both ends of the UDIP and that the amount of water and how it flows through the UDIP is artificially controlled. When both of the dams are closed, the UDIP is more like a "bath tub" than a river. These conditions adversely impact all aquatic species that depend upon flow in a water system to sustain a population. "Flow regime is regarded by many aquatic ecologists to be

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[80] 40 CFR §131.10(g)(4)
[81] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09 at 42
[82] The percentage of flow in the CAWS segments, Brandon Pool and the UDIP that is represented by effluent discharges is likely to increase in the future as the MWRD faces a requirement to reduce diversion of Lake Michigan water by 2015 from 305 to 136 cfs. Wasik Testimony, 11/9/10 Tr. at 50
[83] 3/10/08 AM Tr. at 90; 1/28/08 Tr. at 258-60

the key driver of river and floodplain ecosystems" because "flow is a major determinant of physical habitat in streams, which in turn is a major determinant of biotic composition."[84] Maintaining natural flow patters "is essential to the viability of populations of many riverine species," including invertebrates and fish[85]

Dams change a waterway system from its original lotic or riverine nature to a modified lentic environment, or in other words, from a naturally flowing river to, in effect, a lake.[86] The resulting lake-like environment is designed and managed to provide minimum flows and levels to accommodate barge traffic and handle periodic flow peaks, including flow peaks that are amplified by CSO events.[87] This fundamental change causes most of the physical limitations in a waterway by eliminating riffles, reducing the amount of fast water, increasing sedimentation, disrupting normal sediment flow, interrupting or eliminating migration, reducing the number and variety of aquatic insects, and reducing habitat complexity.[88] All of these factors create a simplified habitat which leads to a simplified fish community in which fish habitat generalists persist but specialist are eliminated or reduced.[89] This modified lentic environment does not support a balanced, diverse fish population.

The adverse effects of dams on aquatic life have been well-documented on the Fox River. In 2005, a study, partially funded by the U.S.EPA, was published on the effects of dams on fish,

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[84] Ex. 456, Bunn and Arthington, *Basic Principles and Ecological Consequences of Altered Flow Regimes for Aquatic Biodiversity,* at 492, see also 493-494

85 *Id.*, Ex. 456 at 492 and 499 (flow changes caused by dams "ultimately reduce the biological diversity and ecological integrity of floodplain rivers")

[86] Ex. 2 of Ex. 366 at 10; see also Ex. 456 at p. 494, Table 1 and at 496

[87] Ex. 366 at 3 and Ex. 2 of Ex. 366 at 5

[88] USEPA *Water Quality Handbook*, 1994, Sec. 2.9.2, Physical Factors, Table 2-1, Summary of Typical Factors Used in Conducting a Water Body Survey and Assessment; Ex. 366 at 6 and Ex. 2 of Ex. 366 at 11-12

[89] Ex. 2 of Ex. 366 at 14

macroinvertebrates, habitat, and water quality on the Fox River ("2005 Fox River Study").[90] Because the impounded conditions on the Fox River are similar to but not as bad as those in the UDIP, the 2005 Fox River Study provides persuasive evidence in support of the conclusion that that the UDIP satisfies the requirements of UAA Factor 4.

The 2005 Fox River Study found a myriad of adverse consequences of the dams, including: lower IBI and QHEI scores, poor macroinvertebrate scores, lower fish species richness, fragmented fish communities, increased pH fluctuations and decreased dissolved oxygen.[91] The population of tolerant fish species increased in impounded segments of the Fox River, whereas the harvestable-sized sport fish decreased in number.[92] The study also found "strong correlations between habitat quality and fish and invertebrate community quality and that index scores were consistently higher in free-flowing reaches than in impoundments."[93] The impounded habitat was more homogenous and consisted of deep open-water areas, lower current velocities and substrates dominated by fine silts.[94] Not surprisingly, a homogenous habitat creates a homogenous aquatic biota, which is not capable of attaining the CWA aquatic life use goal. The 2005 Fox River Study found that "low-head dams adversely affect[ed] warmwater stream fish and macroinvertebrate communities by degrading habitat and water quality and fragmenting the river landscape."[95] Fluvial specialist and simple lithophiles, which require clean, hard substrates, were found to do poorly in impounded habitats because of the increased siltation and sedimentation; but, habitat generalists and pelagic species did well in the impounded conditions. Finally, the 2005 Fox River Study found that the adverse effects of the

[90] Attachment 3 of Ex. 2 of Ex. 366, Santucci, V.J., S.R. Gephard, and S.M. Pescitelli. 2005. Effects of multiple low-head dams on fish, macroinvertebrates, habitat, and water quality in the Fox River, Illinois. North American Journal of Fisheries Management 25:975-992
[91] Ex. 366 at 11 and Ex. 2 of Ex. 366 at 12-13
[92] Ex. 2 of Ex. 366 at 13
[93] Attachment 3 of Ex. 2 of Ex. 366
[94] Attachment 3 of Ex. 2 of Ex. 366
[95] Ex. 2 of Ex. 366 at 13

impoundments were not limited to the area of the dam, but were observed throughout the river basin.[96] In contrast, in free flowing rivers, diverse and healthy fish communities and macroinvertebrate assemblages were present throughout the rivers.[97]

The adverse consequences on habitat conditions and aquatic life of dams and impoundments are worse in the LDR UAA segments than in the Fox River because there are more of them and they are located relatively closer to each other in a more urbanized environment. Rivers that have dams so close to one another that a large percentage of the area between them is impounded are affected more than rivers on which dams are widely spaced.[98] The spacing between the dams in both the CSSC and the LDR is very small, and as the spacing between the dams decreases so does the diversity in the fish community.[99] The Brandon Road Pool, which the Agency agrees is not capable of attaining the CWA's aquatic life use goal, is 100% impounded. The Dresden Pool, of which the UDIP is a part, is 93% impounded, a difference of only 7%.[100] In contrast, the Fox River is only approximately 50% impounded.[101] Further, the Fox River has low-head dams while the UDIP has high dams, which are more detrimental because they do not allow any fish to pass through except via the locks.[102]

In his testimony regarding the UDIP, Agency witness Mr. Smogor, agreed that "if you put impoundment into a system by – almost by definition, you're going to reduce the biological

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[96] Ex. 2 of Ex. 366 at 13

[97] Ex. 2 of Ex. 366 at 14. The District's aquatic biology and habitat expert, Dr. Scudder Mackey, also provided testimony demonstrating the harmful effects of dams on aquatic life in his discussion of the numerous dam removal projects he has worked on in the Great Lakes.[97] In particular, Dr. Mackey described a multi-year study by the U.S.G.S. on the Muskegon River dam removal project which saw "very distinct improvements" in the fish community in the years after the dam was removed. 5/17/11 AM Tr. at 80-82

[98] Ex. 2 of Ex. 366 at 12, citing Lyons *et al.* 2001

[99] Ex. 2 of Ex. 366 at 11, citing Lyons, J., R.R. Peitte, and K.W. Niermeyer. 2001. *Development, validation, and application of a fish-based index of biotic integrity for Wisconsin's large warmwater rivers.* Transactions of the American Fisheries Society 130:1077-1094

[100] Ex. 2 of Ex. 366 at 14

[101] Ex. 2 of Ex. 366 at 12 & 14

[102] Ex. 2 of Ex. 366 at 14

integrity."[103] Typical of highly impounded waters, the UDIP has a simplified habitat and a corresponding simplified fish community dominated by generalists.[104] As concluded in the LDR UAA Report, this limited fish community is also what will be present in the future because limited habitat opportunities improvements exist in the UDIP and the introduction of substrate diversity and riffle habitats is difficult because of the impounded condition of the river.[105] Furthermore, creation of riffles in the UDIP is not feasible because they would interfere with the protected navigation use.

2. The Flow-Controlled Nature of the UDIP Satisfies UAA Factor 4

The flow and water level management of the UDIP to accommodate barge traffic and handle periodic peak flows, including those amplified by CSO discharges, also contributes to meeting the requirements of UAA Factor 4.[106] Unlike waters where flow is not artificially managed, there is no seasonality to the flushing that occurs in the UDIP. In a natural system, high spring flows cause a flushing effect which is followed by a fairly constant flow during the summer and fall. That's not the case in the UDIP which is managed by the Corps and the Metropolitan Water Reclamation District to maintain a pool level necessary for the benefit of barge traffic and to control pool levels to accommodate high rainfall events.[107] Water depths in upstream waters are lowered (by as much as 3 feet) to accommodate an anticipated storm event *(i.e.,* to provide additional upstream storage for flood control) by sending the water in the CSSC down to the LDR.[108] Typical flow fluctuations in the Brandon Road Pool are also not gradual

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[103] 1/28/08 Tr. at 258
[104] Ex. 2 of Ex. 366 at 14
[105] Attachment A, UAA Report at 6-26
[106] Ex. 366 at 3 and Ex. 2 of Ex. 366 at 5
[107] Ex. 366 at 3, Ex. 2 of Ex. 366 at p. 7 and 11/9/09 AM Tr. at 90-91
[108] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304,* R08-09, p. 42, *citing* Illinois EPA Statement of Reasons, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System, and Lower Des Plaines River:*

nor do they follow a normal seasonality associated with flows in waterways.[109] The flows in the LDR, especially below the Brandon Lock and Dam, can change every two hours, sometimes more often, and the change in flow can be thousands of cubic feet per second within that short a time, either up or down, or there can be no flow of water at all for extended periods of time.[110] These extreme changes do not necessarily correspond to rainfall events, so they can occur any time of the year and are not predictable.[111]

These random and abrupt high flows are detrimental to fish and invertebrates in the UDIP, especially because the high flows may occur when fish are most vulnerable, particularly larval fish.[112] Adverse impacts to fish include causing nest abandonment and/or displacement of recently hatched fry. Also, the flow fluctuations mobilize and deposit fine sediments over eggs, which can suffocate the eggs or reduce hatching success.[113] The precipitous drops in water levels that occur for the purpose of anticipating significant amounts of run-off during wet weather events, including high CSO discharges, cause fish, nests and eggs to be stranded in

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Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304, R08-09, October 26, 2007, at 32-33, and Illinois EPA Statement of Reasons at 32. It is not uncommon for the water depths in the CAWS to change 4 to 6 feet within a 24 to 48 hour period coupled with a rapid change in flow velocity. Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09, p. 42, *citing* Illinois EPA Statement of Reasons, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System, and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09, October 26, 2007, at 32-33; see also 1/31/09 Tr. at 227

[109] 11/9/09 AM Tr. at 90; see also the Corps data on water level controls for the Brandon Road Lock and Dam during the period from 2009 through 2011 on the graphs contained in Exhibit B hereto. This additional water level data, which can be viewed for each day in the past five years on the Corps' website, is submitted in part in response to a comment by the U.S. EPA that indicated the record did not contain sufficient flow data for areas below the Lockport Dam. The Corps' Brandon Road Lock and Dam water level data is available at: http://www2.mvr.usace.army.mil/WaterControl/stationinfo2.cfm?sid=IL03&fid=JOLI2&dt=S

[110] 11/9/09 AM Tr. at 13, 90

[111] 11/9/09 AM Tr. at 91

[112] Ex. 2 of Ex. 366 at 6; see also Ex. 455, Kohler and Hubert, *Inland Fisheries Management in North America, 2nd Ed. (1999) at p 275 ("Rapidly fluctuating flow changes habitat faster than some fishes and invertebrates can endure.")*

[113] Ex. 366 at 3; Ex. 2 of Ex. 366 at 6

shallow or confined areas and make them subject to increased predation or desiccation.[114] Even the small Brandon Tailwater area is significantly impacted by the flow-control conditions in the UDIP. Admittedly, the Brandon Tailwater provides relatively better habitat than any of the other areas in the UDIP because it has the only riffle habitat. Its riffle habitat makes it a potential spawning area for obligate riffle species, such as darters and madtoms.[115] However, not only does it represent only about 10% of the UDIP area, but due to its shallow water, it is most severely affected by the erratic flows that occur in the UDIP.[116] These erratic flow conditions adversely affect successful spawning in the Brandon Tailwater due to increased stranding of nests, larvae and adult fish during low flow fluctuations and the sweeping away of these nests, eggs, and larvae during high flows.[117] EA Engineering personnel testified to seeing small fish get stuck in isolated pools along the edge of the Brandon Tailwater because of severe rapid fluctuations in water levels.[118] Another witness testified to seeing the water in the Brandon Tailwater sink from about thigh high deep to ankle deep within 15 to 20 minutes.[119]

None of this evidence concerning the adverse effects of the UDIP flow fluctuations on aquatic life was considered by the Illinois EPA in determining the appropriate use designation for the UDIP. As a result, it reached the incorrect conclusion that the UDIP can "minimally" attain the CWA goals. In its testimony, the Illinois EPA admitted it did not consider whether extreme changes in flow occurred in the UDIP and how those changes negatively impacted

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[114] Ex. 366 at 3; Ex. 2 of Ex. 366 at 6; 11/9/09 PM at 57. The Illinois EPA witness Chris Yoder also agreed that the sudden and severe flow fluctuation can disrupt fish feeding and spawning. 1/31/09 Tr. at 227; see also Ex. 455 Kohler and Hubert (1999) at p. 275 ("Stranding of stream organisms may occur, depending on stream channel shape and the rate of change in discharge or depth. Fishes adapted to the shallow, slower-current areas along stream margins are less abundant in sites subjected to daily flow fluctuations.")
[115] Ex. 366 at 12
[116] Ex. 366 at 12
[117] Ex. 366 at 12 and Ex. 2 of Ex. 366 at 6
[118] 11/9/09 PM at 61-62
[119] 11/9/09 PM Tr. at 62

aquatic life.[120] However, its expert, Chris Yoder, testified that flow fluctuations causing changes in water levels of 4 to 6 feet within a day's time are extreme variations that "overrule" fish habitat areas.[121]

The Illinois EPA does concede that the only fish that would be able to reside in the UDIP would need to be able to "adapt to its unique flow conditions."[122] But this acknowledgement doesn't go far enough in accepting the inherent limitations on the quality of the fish community caused by the flow-controlled nature of the UDIP. Simply stated, there is no way that fish can "adapt" to having their nests, eggs and larvae stranded by a sudden drop in water levels or washed away by high flows that occur during their spawning season. They can't prevent it from happening and they can't avoid it from happening in the UDIP, including in the Brandon Tailwater. The dams, with their adverse effects on habitat in the UDIP, along with irregular flows will always limit the aquatic life in the UDIP and prevent it from attaining the CWA aquatic life use goal. As the U.S. EPA's 1996 Technical Guidance for Streams and Small Rivers aptly states, "[t]he quality of habitat structure and the flow regime are intricately associated. In areas of extensive channelization, communities may consist only of generalists and opportunists able to withstand harsh flow conditions directly, or the secondary effects of those flow conditions (e.g., reduced abundance of food or presence of habitat refuges)."[123]

In satisfaction of UAA Factor 4, the dams and accompanying flow-controlled nature of the UDIP preclude it from attaining the CWA aquatic life use goal. It is not feasible to eliminate these conditions or to modify the flow-controls such that a higher use can be attained. The

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[120] 3/10/08 PM Tr. at 193
[121] 1/31/09 Tr. at 227
[122] 3/11/08 Tr. at 20
[123] U.S. EPA, *Biological Criteria: Technical Guidance for Streams and Small River*", Revised Edition, 1996, Chapter 5 "Flow Regime" at p. 86, available at: http://www.epa.gov/bioiweb1/pdf/EPA-822-B-96-001BiologicalCriteria-TechnicalGuidanceforStreamsandSmallRivers-revisededition1996.pdf

evidence in this rule-making shows that dams and impoundments reduce biological integrity and cause or accentuate almost all of the adverse aquatic conditions and limitations in the UDIP, including sedimentation, siltation, lack of riffles and fast water, and habitats in which only aquatic generalists can thrive. Further, the purposes of the dams, including controlling flow conditions to accommodate commercial traffic and stormwater and wastewater discharges, contribute to severely limiting the UDIP suitable aquatic habitat. There will not be any significant improvement in aquatic life in the UDIP without the elimination of the dams.[124] But the dams and flow-controls are both necessary to ensure the protection of existing uses of the UDIP – commercial navigation and flood control. As the Board already has found, these conditions are not reversible in the foreseeable future. In fact, the likelihood that the dams and impoundments would be removed is remote. Because these conditions fully satisfy UAA Factor 4, the Board should decline to accept the Illinois EPA's proposed UDIP use designation and adopt a use designation that recognizes the limited aquatic life potential of the UDIP caused by its impounded and flow-controlled nature as proposed by MWGen in the attached Exhibit A.

B. Human Caused Conditions or Sources of Pollution Prevent the Attainment of CWA ALU Goals Under UAA Factor 3

Sedimentation, including contaminated sediments, elevated levels of nutrients, barge traffic and, for the UDIP, the introduction of the invasive Asian Carp species, are all human caused conditions and pollutants that prevent the attainment of Clean Water Act ALU goals and satisfy the UAA Factor 3.[125] In Subdocket A of this rule-making, the Board already has found that the South Branch of the Chicago River, CSSC and LDR UAA segments are significantly

[124] 11/10/09 AM Tr. at 61

[125] 40 CFR §131.10(g)(3); The District's expert Scott Bell testified that the sediment conditions were "so uniformly poor in the CAWS that the result is that the macroinvertebrate populations show less variation." 5/16/11 Tr. at 22

impacted by human caused conditions and sources of pollution satisfying UAA Factor 3.[126] Specifically, the Board found that both the Upper and Lower CSSC have steep banks, vertical dock walls, and commercial barge traffic, which prevents it from attaining the CWA recreational goals. [127] The Board also found that both the Brandon Road Pool and UDIP of the LDR could not attain CWA recreational goals because they were significantly impacted by human caused conditions and sources of pollution, including significant commercial transport of bulk commodities.[128] Those human caused conditions and sources of pollution identified by the Board in Subdocket A equally apply in Subdocket C to satisfy UAA Factor 3 for these segments of the CAWS and the LDR.

Because of the commercial and urbanized nature of the CAWS, and the Brandon Pool and UDIP segments, these conditions cannot be remedied or would cause more environmental damage to correct than to leave in place. Also, the arrival of the Asian Carp into the UDIP, and the proposed solutions to prevent their progress beyond the electric barriers in the CSSC and into Lake Michigan, also contributes to the reasons why UAA Factor 3 is applicable. Thus, the while the evidence supports the proposed ALU B designation for these CAWS segments, the Agency's proposed UDIP ALU is not attainable and should not be adopted by the Board.

1. Extensive Sedimentation and High Turbidity Levels Present in the UDIP Prevent the Attainment of CWA ALU Goals

The physical characteristics of the sediments and the preponderance of sedimentation, including contaminated sediments, are key limiting factors to improving the biological

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[126] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304,* R08-09, June 16, 2011 at. 42-43

[127] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304,* R08-09, June 16, 2011 at 42-43

[128] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09, June 16, 2011 at 49-50

conditions in the UDIP.[129] As referenced in the pre-filed expert testimony of EA Engineering's Greg Seegert, the U.S.EPA has found that "[s]edimentation and siltation problems account for more identified water quality impairments of US waters than any other pollutant."[130] The main sources of sediment loading in water systems are urban, construction, and agricultural runoff and all of these sources are present in the UDIP.[131]

Sediment is fine, silty and organic and is not suitable for many higher quality fish species which need a hard, clean substrate for spawning.[132] Sedimentation impairs aquatic life by filling rearing pools, filling interstitial spaces of spawning gravels, impairing fish food sources, and reducing beneficial habitat structure in stream channels.[133] Indeed, Mr. Yoder, a witness for Illinois EPA, found that streams in highly urbanized areas typically do not achieve Clean Water Act goals because of sedimentation.[134] There is no doubt that the UDIP is in a highly urbanized area.

There is sediment in all three navigational pools, Lockport, Brandon and the UDIP, as well as the side-channels and backwater areas. The adverse effects caused by the extensive presence and nature of the UDIP sediments were barely considered by the Illinois EPA, who ignored relevant scientific data to reach its conclusion that the UDIP was capable of "minimally" attaining the CWA ALU goals. Paradoxically, given that sediments can be a severe limiting

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[129] Ex. 2 of Ex. 366 at 9
[130] Ex. 2 of Ex. 366 at 9, quoting from USEPA Report, August 2003
[131] Ex. 369 at 5
[132] Ex. 2 of Ex. 366 at 9; see also Testimony of Scott Bell, 5/16/11 Tr. at 114-115
[133] Ex. 366 at 4; Ex. 2 of Ex. 366 at 9; 5/16/11 Tr. at 13; 12/3/08 Tr. at 9; see also Ex. 455, Kohler and Hubert, Inland Fisheries Management in North America (1999) at 273 ("Various smaller fishes take refuge from predators and water current in the interstices of wood debris or under streambed rock.")
[134] Ex. 2 of Ex. 366 at 9, Yoder, C.O., R.J. Miltner, and D. White. 2000. Using Biological Criteria to Assess and Classify Urban Streams and Develop Improved Landscape Indicators. In Proceedings of the National Conference on Tools for Urban Water Resource Management and Protection. Published by U.S.EPA, Office of Research and Development. Washington D.C. EPA/625/R-00/001

factor in a waterbody like the UDIP, there is no evidence that the Agency considered the harmful effects on aquatic life due to the presence of the fine, silty and organic sediments in the UDIP.

In addition to overlooking the harmful effects of the widespread siltation and sedimentation present in the UDIP, the Agency evaluated the impact of sediment resuspension in only a very "cursory" manner and only for the limited purpose of assessing compliance with the cadmium chronic water quality standard.[135] Otherwise, the Illinois EPA concluded, without any supporting data, that sediments were improving because of the reduction in CSO overflows from the partial completion of TARP and better wastewater treatment to point source discharges.[136] Data introduced in this record strongly rebuts the Agency's conclusion. Sedimentation in the UDIP was moderate to severe in 70% of the areas evaluated in 2003 and in 66% of the areas evaluated in 2008, which clearly shows that there has been little improvement in the amounts of sediment in the UDIP due to the partial completion of TARP.[137] The volume of sediment loading in the UDIP will continue to be high, even after the CSO discharges are reduced when TARP is fully completed.[138] The evidence from studying UDIP sediment conditions in the past decade clearly refutes Illinois EPA's speculation that the sediment conditions are improving.

Turbidity, an outgrowth of sedimentation, is another major stressor in the UDIP.[139] Turbidity is caused by eroded soils and resuspended sediments, particularly when there is flow over clay and silty sediments, and it increases during high flow events.[140] Discharges from wastewater treatment plants also contribute to turbidity as does resuspension of bedded sediments from barge traffic during low flow, as evidenced by the photograph identified as

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[135] Ex. 366 at 5, citing 3/11/08 Tr. at 143-144, 148-149
[136] 4/23/08 Tr. at 217, 1/28/08 Tr. at 161-162, 181-182
[137] Ex. 366 at 5, Ex. 2 of Ex. 366 at 10
[138] 11/9/09 PM Tr. at 82-83
[139] Ex. 369 at 8-9
[140] Ex. 369 at 9, 1/13/10 PM Tr. at 52

Exhibit 379.[141] The LDR UAA Final Report identified the presence of significant turbidity in the UDIP, stating that "the variation of suspended solids in the Des Plaines River is significant because the sediments are continuously being resuspended by barge traffic."[142] Figure 2.21 of the LDR UAA Final Report showed that the spikes in suspended solids concentrations were the result of a barge tow transit and that the range in concentrations was common.[143] Similarly, the Agency's own limited review of elevated cadmium levels in connection with the effects of contaminated sediments in the UDIP showed that cadmium levels in areas where there were no point sources were elevated, but less so during the winter when there was less barge traffic, leading the Agency to conclude that barge traffic stirring up sediment was causing the elevated levels of cadmium in the water.[144]

MWRD data from 2005 and 2008 for the UDIP also showed turbidity levels sufficient to cause adverse effects in some aquatic life.[145] Filter feeding zooplankton are sensitive to suspended solids and turbidity. In particular, the survival of a common species of zooplankton, *ceriodaphnia dubia*, was affected turbidity levels equivalent to those in the UDIP.[146] The evidence in the Subdocket C record clearly demonstrates that turbidity is another human caused condition in the UDIP which limits its ability to attain the CWA ALU goals.

2. Contaminated Sediments also Contribute to the UDIP's Inability to Attain CWA ALU Goals Under UAA Factor 3

The adverse effects on aquatic life from the extensive sedimentation present in the UDIP, including the continuing contributions from the two upstream navigational pools (Lockport and Brandon), are made worse by their severe contamination with metals, synthetic organics and

[141] 1/13/10 PM Tr. at 51, Ex. 369 at 9, Exhibit 379
[142] Attachment A, UAA Report at 2-49
[143] Attachment A, UAA Report at 2-49, Fig. 2.21
[144] 3/10/08 AM Tr. at 96.
[145] 1/13/10 PM Tr. at 49
[146] Ex. 369 at 8-9

nutrients - - and the sediment quality is not improving.[147] The Board previously recognized in the AS96-10 adjusted standard proceeding, that "[h]istorical practices have caused substantial residual chemical contamination to be present in the sediments of the waterway."[148] The Agency does not dispute that contaminated sediments are present in both the CSSC and the UDIP.[149] No remediation of this historical sediment contamination has since occurred. Moreover, much of the sediment contamination is from existing point and non-point sources, including municipal point source discharges, CSOs, urban runoff and storm sewers.[150] As Dr. Allen Burton testified, nutrients, metals, pathogens, synthetic organics such as petroleum aromatic hydrocarbons ("PAHs"), and new age pesticides such as pyrethroids are common constituents of both point and nonpoint source loadings.[151] Total PAHs in the sediments of the Upper Illinois River Basin are among the highest nationwide.[152] Concentrations of DDT, polychlorinated biphenyls ("PCBs"), methyl mercury and dieldrin in fish and sediments in the Upper Des Plaines River and its tributaries are also among the highest concentrations observed nationwide.[153] The LDR Final UAA Report reached the same conclusion, identifying the LDR sediments as having high concentrations of toxic chemicals.[154]

Given the ability of sediments to be resuspended and to travel downstream, the toxicity data on the upstream CAWS water segments is indicative of the sediment contamination in the UDIP. The contamination present in the CAWS sediments has been well documented.

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[147] Ex. 369 at 5
[148] *In the Matter of: Petition of Commonwealth Edison Company For Adjusted Standard From 35 Ill.Adm. Code 302.211(d) and (e),* AS 96-10, October 3, 1996
[149] 1/28/10 Tr. at 100
[150] Ex. 369 at 3
[151] Attachment 1 of Ex. 369 Review of the Illinois EPA Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and the Lower Des Plains River: Proposed Amendments to 35 Ill. Adm. Code Parts 301, 302, 303, and 304., G. Allen Burton, Jr., September 4, 2008, at 6; See also S. Bell Testimony 5/16/11 Tr. at 13-14
[152] Ex. 369 at 8
[153] Ex. 369 at 8
[154] Attachment A, UAA Report at 3-40 – 3-41

Depositional sediments in the CAWS are acutely or chronically toxic to all or most aquatic species, including zooplankton, benthic invertebrates, fish and amphibians and are unsuitable for any desirable species.[155] Generally, the acutely toxic depositional sediments are located in areas suitable for fish habitat, such as shallow waters, and not in high current areas, like the main channel.[156] In particular, the shallow waters are excellent habitats for spawning, and yet the sediments in those waters are severely contaminated with PAHs.[157] Also, the main exposure route of toxicity to benthic organisms is the sediment pore water, the water within the sediment.[158] In a 1995 study of the Upper Illinois Waterway done by Dr. Alan Burton, which included the UDIP, he found that the PAHs and ammonia in the pore water were the highest contributors to toxicity and mortality of organisms.[159] In looking at the EA 2003 habitat evaluation of the UDIP compared to the 2008 EA habitat study, sedimentation has not decreased, therefore, it follows that contamination in the sediments has not decreased.[160]

Illinois EPA thought there was not enough UDIP sediment information to determine whether the presence of contaminated sediments contributed to satisfying UAA Factor 3.[161] Hence, Illinois EPA decided that the UDIP can minimally attain the CWA goals without considering the adverse effects of sediment contamination. It presumed contaminated sediments are not detrimental to habitat and aquatic life in the UDIP because it did not have any information showing otherwise.

But there was sufficient scientific information on UDIP sediment contamination available to the Illinois EPA, and more was collected and presented in this rule-making, to show that

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[155] Attachment 1 of Ex. 369 at 7-10; 1/13/10 PM Tr. at 87
[156] Ex. 369 at 8
[157] Ex. 369 at 8
[158] 1/14/10 AM Tr. at 102-103
[159] 1/14/10 AM Tr. at pp. 102-103
[160] 1/13/10 PM Tr. at pp. 127-128
[161] 3/10/08 AM Tr. at 93

contaminated sediment represents a human caused condition preventing the UDIP from attaining the CWA ALU goals. The UDIP sediment data shows that contamination is pervasive, detrimental to aquatic species and is not improving. The former owner of the MWGen electric generating stations, ComEd, performed multiple studies of the sediments in the 1990's to determine contamination levels. In addition to the multiple ComEd studies, there are also multiple studies from the 2000's: the 2001 U.S.EPA study, the 2007 MWRD GC study, and the most recent May 2008 EA study. These studies consistently demonstrate that sediments in the Dresden and Lower Brandon Pools, including the Brandon Tailwater, are highly contaminated with organics (PCBs and PAHs), nutrients, cyanide and metals, including zinc, nickel, cadmium, chromium, copper, lead and mercury. This objective evidence conclusively demonstrates that there is no scientific basis to support the Agency's subjective belief that sediment contamination is improving. Rather, a comparison of the sediment contamination studies in the 1990's to the studies in the 2000's shows that high levels of sediment contamination and exceedances of internationally accepted sediment quality guidelines (SQGs) are as common now as in the early 1990s.[162]

The ComEd 1990's studies of the LDR showed exceedances of SQG's for metals, PAHs and PCBs at almost every sample location.[163] In the Lower Brandon Pool, metals, total PAH, and PCB concentrations in the sediments exceeded the Probable Effects Concentration (PEC) values.[164] In the UDIP, concentrations of metals, PAHs and PCB were elevated, and some exceedances were extremely high, particularly for metals and PAHs, at the lower end of the

[162] Attachment 1 of Ex. 369 at 7&9; Sediment quality guidelines (SQGs) are widely used to determine which sediments are toxic and thus represent a threat to the aquatic biota. SQGs have been used in Superfund, RCRA and State investigations and are frequently used to establish "clean-up" levels for remediation activities.
[163] Ex. 369 at 7, Attachment 1 of Ex. 369 at 9
[164] Attachment 1 of Ex. 369 at 9; Probable Effects Concentration ("PEC") represents concentrations in the middle of the effects range and above which adverse biological effects are expected to occur more often than not.

UDIP.[165] All of the sampling stations exceeded the sediment quality guidelines ("SQG") for total PAHs, and of the 35 sampling stations in the UDIP and Lower Brandon Pool, 80% of the sediments sampled exceeded the PEC levels up to 30-fold.[166] Moreover, sediments from a majority of the sampling locations smelled of petroleum and released oily sheens into the overlying water.[167]

EA Engineering also performed a more recent UDIP and Brandon Road Pool sediment contamination study in 2008. The 2008 EA Study demonstrated that concentrations of PAHs and total PCBs were elevated and exceeded both the threshold effects concentration ("TEC") and PEC values, clearly establishing that the overall quality of the sediment in the UDIP and the Brandon Road Pool is still poor.[168] When sediment samples collected by EA during its 2008 Study were opened during the hearings, the Hearing Officer observed that the sediment was murky, remarking "Oh, yeah, it smells like gasoline. I'm not tasting it."[169] Spatial representations of these contaminated sediments (Exhibits 377 and 378) show the elevated contamination in the sediments from the Brandon Lock & Dam to the I-55 Bridge, and continuing to just below the I-55 Bridge where the levels get much lower.[170] Exhibits 377 and 378 graphically depict that large portions of both the Brandon Pool and the UDIP are of poor sediment quality characteristic of urban-dominated watersheds, and thus are unable to support a healthy aquatic habitat.[171]

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[165] Attachment 1 of Ex. 369 at 9
[166] Attachment 1 of Ex. 369 at 9
[167] 1/13/10 PM Tr. at 87
[168] Appendix C of Attachment A of Ex. 369, Sediment Chemistry Study, Upper Illinois Waterway, Upper Dresden and Lower Brandon Pools, EA Engineering, Science, and Technology, 2008; TEC is for threshold effects concentration, which represents concentrations below which adverse biological effects are not expected to occur.
[169] 1/13/10 PM Tr. at 89
[170] Exhibit 377, Exhibit 378, 1/13/10 PM Tr. at 20-21
[171] Attachment 1 of Ex. 369 at 9

A comparison of the results from all of the sediment studies conducted from the 1990's to 2008 shows there was very little overall improvement in the sediment quality.[172] High levels of sediment contamination and exceedances of SQGs for probable adverse biological effects are as common now as they were in the early 1990's.[173] All of the studies showed highly contaminated sediments which demonstrates that depositional sediments remain significantly degraded and are not being reduced.[174] As Dr. Burton testified, "there is no evidence … of data that shows declines [of contaminated sediment levels] are occurring."[175]

In its hearing testimony, the Illinois EPA admitted that it did not thoroughly consider whether contaminated sediments in the Brandon Pool and UDIP precluded these waters from attaining CWA aquatic life goals.[176] Illinois EPA witness Rob Sulski conceded that the Agency's belief that the sediment quality in the CSSC and UDIP was improving was not based on any data.[177] He also agreed that the Agency did not know whether the *in situ* sediments or the constantly added sediments are not toxic.[178] The data showing the extensive presence of siltation, sedimentation, and contaminated sediments simply was not reviewed by the Illinois EPA, for, as Dr. Burton testified, "[i]f it had been, the [Illinois EPA] could not have reached the conclusion that it thinks sediment contamination conditions are improving."[179] There clearly is no reliable data establishing a trend of improving sediment quality in the UDIP.[180]

The UAA Report was incorrect in its statements regarding the improvement of sediment quality. This was due in part to its authors' consideration of only average sediment sampling

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[172] Appendix C of Attachment A of Ex. 369, Sediment Chemistry Study, Upper Illinois Waterway, Dresden and Lower Brandon Pools, EA Engineering, Science, and Technology, September 2008, Table 11
[173] Attachment 1 of Ex. 369 at 6
[174] Ex. 369 at 7-8
[175] 1/13/10 PM Tr. at 98
[176] 3/10/08 PM Tr. at 164, 3/11/08 Tr. at 148-149
[177] 4/23/08 Tr. at 217 & 1/28/08 Tr. at 161-163
[178] 1/28/08 Tr. at 165
[179] 1/14/10 AM Tr. at 71
[180] Attachment 1 of Ex. 369 at 9

values from U.S.EPA's sediment sampling data base. As Dr. Burton testified, this is not a "meaningful or scientific assessment" because "the average values do not reveal whether they reflect a broad or narrow range of individual sediment sampling locations."[181] Further, the data in the UAA Report did not differentiate or even disclose the sediment sample types or locations. As Dr. Burton testified, due to these omissions, there was "no way to determine if the data came out of the main channel where you wouldn't have high levels or the side channel or back water areas."[182]

Another adverse effect of great concern associated with contaminated sediments is photoinduced-toxicity. Photoinduced-toxicity is when the toxicity of a contaminant is increased in the presence of sunlight, even when very small amounts of PAHs are present, *i.e.,* ug/L(ppb) levels, and is more common in shallow waters.[183] There are many areas of the UDIP, particularly the Brandon Tailwater, that are shallow and thus subject to photoinduced PAH toxicity. [184] Although the authors of the LDR UAA Report did not conduct any review of the evidence of photo-induced toxicity conditions in the UDIP, they nevertheless acknowledged that photo-activation in shallow portions of the LDR may have some adverse effects to benthic organisms.[185] The PAH levels found in the sediments in the UDIP are on the order of ppm, not ppb, and exceed the PEC up to 30-fold, which is so high that it is causes acute toxicity without even the need for UV stimulation.[186] Even if the PAH toxicity of the UDIP sediments were to somehow significantly decrease to below the PEC levels, the shallow areas like the Brandon Tailwater would still be highly toxic to aquatic life because of photoinduced-toxicity.

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[181] 1/14/10 AM Tr. at 72
[182] 1/14/10 AM Tr. at 72-73
[183] Ex. 369 at 8
[184] Attachment 1 of Ex. 369 at 10; Ex. 369 at 8
[185] IEPA Statement of Reasons, 10/26/07, Attachment A, Part 1 at p. 3-40
[186] Attachment 1 of Ex. 369 at 10, Ex. 369 at 8

Another significant, adverse consequence of contaminants present in depositional sediments is that their presence results in bioaccumulation in benthic organisms.[187] There are dramatic correlations between fish tissue consumption advisories and the levels of sediment contamination.[188] As Illinois EPA's witnesses testified, the entire UAA waterway is under a fish consumption advisory for PCBs and mercury.[189] The fish tissue advisories mean that consumption of the fish is unsafe for both humans and wildlife.[190] Thus, regardless of the quality of the water, the contaminated sediments in the UDIP will continue to negatively impact the fish community via common fate and transport processes such as resuspension, advection, bioturbation and diffusion.[191]

3. Nutrients, Ammonia, and Emerging Contaminants Are Significant Stressors on the Waterway Which Do Not Allow For Attainment of CWA ALU Goals

Nutrient enrichment and ammonia are also significant stressors of the UDIP that contribute to its inability to attain the CWA ALU goals. Nutrients, such as nitrogen and phosphorus, are a common pollutant of human dominated watersheds.[192] Nutrients disrupt aquatic ecosystems by increasing biological productivity, causing increased bacterial respiration and increased eutrophic conditions, creating conditions that are favorable to less desirable fish and invertebrate species and impair beneficial uses.[193] The UIW has high levels of nitrogen and phosphorus from above Chicago through the Dresden Pool, beyond which they drop significantly.[194] When such high levels of nitrogen are present, ammonia becomes another

[187] Attachment 1 of Ex. 369 at 7
[188] Attachment 1 of Ex. 369 at 6; Ex. 369 at 6
[189] 1/28/08 Tr. at 203
[190] 1/13/10 PM Tr. at 36
[191] Ex. 369 at 5
[192] Ex. 369 at 9
[193] Ex. 369 at 9 and Attachment 1 of Ex. 369
[194] Attachment 1 of Ex. 369

stressor of particular concern.[195] Ammonia is particularly toxic to certain aquatic species, such as *Hyalella azteca*, which is a USEPA indicator species that is relatively sensitive and hence, predictive of other species.[196] Ammonia has also been found to be a primary sediment stressor in the UIW and Brandon Pool area.[197] A USGS study (Groschen *et al.* 2004) found that the amount of ammonia in the CSSC at Romeoville was one of the highest nationwide and that the elevated concentrations of nutrients and other organic wastewater contaminants are the primary causes of degradation of the UIW.[198]

Endocrine disrupters and other emerging contaminants are a few of the other organic wastewater contaminants referenced in the USGS study which contribute to impairing the UIW. Emerging contaminants are organic compounds found in pharmaceutical products, personal care products, and veterinarian and livestock operations.[199] These adversely affect fish in the UDIP because exposed fish suffer from reproductive disruption and feminization.[200] A 1999-2000 nationwide study by the USGS found emerging contaminants in 80% of the streams sampled.[201] And a Canadian study found that chronic exposure to the emerging contaminants resulted in feminization of male fish and ultimately a near extinction of the fathead minnow from a lake.[202] These emerging contaminants, which are prevalent particularly in the effluent-dominated UDIP, severely impair its ability to support a diverse and healthy aquatic community.[203]

The likeliest sources of all of the above contaminants are wastewater from the wastewater treatment plants ("WWTP"), nonpoint source inputs from both urban and agricultural runoff, and

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[195] Ex. 369 at 9
[196] 1/13/10 PM Tr. at 80
[197] Ex. 369 at 9
[198] Attachment 1 of Ex. 369 at 14
[199] Ex. 369 at 10
[200] Ex. 369 at 10; Attachment 1 of Ex. 369 at 15
[201] Attachment 1 of Ex. 369 at 15
[202] Attachment 1 of Ex. 369 at 15
[203] Attachment 1 of Ex. 369 at 16

the large discharges from the CSOs. As stated previously, the dominant flow in the system is approximately 70% wastewater effluent from the WWTPs. There are also significant loadings of raw sewage from upstream CSOs with associated solids, nutrients and chemical contaminants.[204] From January 1, 2007 through August 6, 2008, there were 117 CSO events at four major CSO stations recorded by the MWRD.[205] The TARP will reduce but not cease the loadings from the CSOs.[206] TARP was previously scheduled to be completed by 2024; however, the MWRD stated in its January 3, 2011 filing in this rule-making that it is now estimated to be completed in 2029.[207] That is approximately 17 years in the future. At the same time, nonpoint source inputs from the impact of increasing urbanization of the Will County area in which the UDIP is located are reasonably expected to increase.[208]

Illinois EPA repeatedly stated that one of the main reasons it thought sediments were improving was the reduction in CSOs overflows and better wastewater treatment,[209] while also acknowledging its belief was not based on any data and that the completion of TARP is many years in the future.[210] Under the CWA, water quality standards must be reevaluated every 3 years.[211] Therefore, there are at least five or six UDIP water quality standards triennial reviews between this rulemaking and the current estimated completion date of TARP. Upgrading the UDIP use designation to the extent proposed by Illinois EPA based upon speculative predictions that the completion of a TARP alone, already delayed numerous times and still at least 17 years in the future, is going to allow the UDIP to attain the CWA ALU goals is legally indefensible. It

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[204] Ex. 369 at 4
[205] Attachment 1 of Ex. 369 at 6
[206] Pre-filed Testimony of Earnest R. Blatchley III at p. 7; Written Responses to Illinois EPA's Pre-Filed Questions for MWRDGC's Witness Adrienne D. Nemura, R08-09(C) June 17, 2011, Response 3.c. & 2/17/09 PM Tr. at 16, 89-90
[207] 9/8/08 AM Tr. at 76; PC #565, Item 11
[208] Attachment 1 of Ex. 369 at 6-7 and Appendix B
[209] 4/23/08 Tr. at 217 & 1/28/08 Tr. at 161-162, 181-182
[210] 1/28/08 Tr. at 161-162; 4/23/08 Tr. at 217, 219
[211] 33 U.S.C. §1313 (c)(1)

is also contrary to the overwhelming evidence of multiple constraints on the UDIP aquatic community that TARP's completion still will not solve.[212]

The only way the completion of TARP may properly serve as a basis for adopting the Illinois EPA's proposed UDIP use designation, is to await the actual completion of TARP and the triennial water quality standards review that will occur thereafter. Only then will it be known what the true extent is of the impact upon the UDIP, positively or negatively, from TARP's completion. An event that may be completed no sooner than 17 years in the future is not a proper legal basis for deciding today whether the UDIP is capable of attaining the CWA ALU goals.

Moreover, the potential effects of TARP's completion are overstated by the Agency. Even after TARP is completed, it will not eliminate all of the CSO discharges and some CSOs will still discharge to the CAWS, continuing to add contaminants to the system.[213] Further, TARP does not address CSO events in Joliet and the UDIP because those parts of the CAWS are beyond TARP's reach. As one of the main purposes of the waterway is to remove the wastewater from the Chicago-land area, it is unlikely that the above stressors caused by the wastewater discharges will cease even with the new water quality standards. Finally, the Agency failed to take into account that the increasingly urbanized nature of the UDIP area results in increased levels of pollutants in stormwater runoff. As the U.S. EPA has found, "the total loading from urban areas can be greater than that in treated domestic sewage. Thus, when

[212] For example, expert testimony supported the conclusion that habitat limitations will still prevent substantial increases in biodiversity and integrity. See, *e.g.,* 11/17/08 Tr. at 211.
[213] Written Responses to Illinois EPA's Pre-Filed Questions for MWRDGC's Witness Adrienne D. Nemura, R08-09(C) June 17, 2011, Response 3.c. & 2/17/09 PM Tr. at 16, 89-90; Pre-filed Testimony of Earnest R. Blatchley III at p. 7

untreated urban runoff is discharged directly into receiving waters, the pollutant loads can be much greater than those from treated domestic sewage and are rightfully a matter of concern."[214]

4. Barge Traffic in the Waterway does not Allow for Attainment of the CWA Goals

Barge traffic limits the quality of aquatic life attainable because it adversely affects aquatic organisms by physically injuring, killing or stranding fish, disrupting or disturbing spawning habitat, uprooting vegetation, increasing turbidity, and enhancing toxicity of the water by re-suspending and dispersing fine grained sediments with toxic compounds.[215] Medium to large fish can be killed by propeller strikes and, in a smaller, narrower river such as the Lower Des Plaines and the CSSC, fish are less likely to be able to avoid propeller strikes.[216] There are also quick and significant changes in river levels caused by the barge's displacement of water. As the barge approaches, water is pushed into adjacent backwaters, and then as the barge passes, the water is sucked out, displacing fish eggs and larvae from the nests.[217] The Board noted in its discussion of recreation in the Brandon Road Pool Segment of the LDR, that when two tows meet in that segment, almost the entire cross section is taken up by the barges making it unsuitable for recreation.[218] Fish within the channel also must contend with the dangers and reduced areas of fish passage caused by the constant passing of large barges. Admittedly, the shoreline in this area is a better habitat for fish than the main channel; however, the barge activity in Brandon Road Pool fleeting area further diminishes the quality of the shoreline habitat, adversely affecting the aquatic life.

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[214] U.S. EPA, *Stormwater Best Management Practice Design Guide: Volume 1,* EPA/600/R-04/121, September 2004, at p. 4-22.
[215] Ex. 369 at. 4, Ex. 2 of Ex. 366 at 9,
[216] Ex. 366 at 4 and Ex. 2 of Ex. 366 at 8
[217] Ex. 366 at 4 and Ex. 2 of Ex. 366 at 8
[218] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09(A), p. 49

Further, in both the Brandon Road Pool and the UDIP, barge propellers stir up sediments, re-suspending them in the water, and repeatedly cause the adverse consequences from turbidity and sedimentation discussed above.[219] As the Illinois EPA stated in its Statement of Reasons, "[b]ecause most of CAWS and Lower Des Plaines River is artificially channelized, it is also routinely subject to unavoidable moderate to severe watercraft passage related disturbances such as sediment souring and wake formation that…disrupts shoreline habitat for aquatic life."[220] As the Illinois EPA testified, the barge fleeting is a commercial activity, which is a protected use under the proposed use designation for the UDIP.[221] Illinois EPA also agreed that the UDIP gets a substantial amount of barge traffic.[222] The adverse effects caused by the barge fleeting will not be reduced because commercial navigation is a protected, existing use that is not reversible. Therefore, the extensive barge traffic in the UDIP also contributes to preventing attainment of the CWA ALU goals under UAA Factor 3.[223]

5. The Presence of Asian Carp in the UDIP Qualifies as "Human Caused Pollution" under UAA Factor 3

Asian Carp have entered the UDIP and introduce yet another "stressor" that, due to its human-caused introduction to these waters, should qualify as "human-caused pollution" under UAA Factor 3. Illinois EPA did not consider any of the ramifications of the introduction of Asian Carp into the UDIP in reaching its conclusion that it is minimally capable of attaining the CWA ALU goals. Attainment of the CWA's aquatic life goals is not achievable under existing conditions. The more recent Asian Carp invasion will push the UDIP even further below the bar of the CWA goals.[224]

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[219] Ex. 366 at 4 and Ex. 2 of Ex. 366 at 8
[220] Illinois EPA Statement of Reasons at 33
[221] 1/29/08 Tr. at 24
[222] 3/10/08 PM Tr. at 12
[223] Ex. 2 of Ex. 366 at 9
[224] Ex. 428, Pre-filed Testimony of Greg Seegert at 2

The spread of Asian Carp is inevitable if left unchecked, and the leading edge of the main Asian Carp population is just downstream of the Dresden Pool, effectively at its doorstep.[225] In the then pending United States District Court for the Northern District of Illinois case addressing a request for a permanent injunction by the State of Michigan and other states to stop the threat of Asian Carp entering Lake Michigan through the CAWS, the district court found that the Asian Carp "invasion front was approximately 30 miles downstream of the CAWS as of the spring of 2009."[226] On appeal, in its August 2011 decision, the Seventh Circuit found that the plaintiff states had "presented enough evidence to establish a good or even substantial likelihood of success on the merits of their public nuisance claims, reasoning that it is "impossible to unring the bell" and the "proper inference to draw from the evidence is that invasive carp are knocking on the door to the Great Lakes."[227] In particular, the Seventh Circuit noted the quick pace of the Asian Carp's advance and its establishment of a dominant position along the way:

> It is especially chilling to recall that in just 40 years the fish have migrated all the way from the lower Mississippi River to within striking distance of the lakes and have come to dominate the ecosystem in the process.[228]

The Seventh Circuit held that although the plaintiff states had adequately shown for preliminary relief purposes "that it is likely irreparable harm will come to pass" if Asian Carp enter Lake Michigan, when balanced against the economic harms caused by closing the locks along Lake Michigan and other requested injunctive relief, it did not support the entry of an injunction.[229]

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[225] Ex. 428 at 5
[226] *State of Michigan v. United States Army Corps of Engineers*, 667 F.3d 765.at 17 (7th Cir. 2011), a copy of the Seventh Circuit Opinion is attached as Exhibit C for ease of review.
[227] *Id.* at 18
[228] *Id.*
[229] *Id.* at 20 & 25

The Asian Carp's eating habits allow them to quickly out-compete both small and large native fish such as the gizzard shad and bigmouth buffalo.[230] They also spawn prodigiously and can live up to 20 years.[231] Two of the Asian Carp species can consume up to 40% of their body weight per day, and basically, "swim around with their mouths open taking in anything they come up with," and are called "aquatic vacuum cleaners."[232] Except during spawning, Asian Carp prefer off-channel areas such as those found in the Dresden Pool.[233] The Seventh Circuit noted that new "bad news" information released by the Obama Administration in April 2011 was that "while experts had thought the carp need coastal rivers between 30 and 60 miles long to spawn, it turns out they can make do with much shorter breeding grounds."[234] Further, the altered nature of the UDIP makes it more susceptible to dominance by the Asian Carp because "[l]ong-term success (integration) of an invading fish species is much more likely in an aquatic system permanently altered by human activity than in a lightly disturbed system."[235] Hence, the developing Asian Carp evidence indicates they are capable of thriving and perhaps spawning in waters like the UDIP.

The establishment of Asian Carp adversely affects the native aquatic life in the UDIP by causing a degraded fish community structure and reductions in certain native species.[236] The UDIP is already degraded by reduced species richness, dominance by tolerant species, lack of intolerant species, elevated incidence of external anomalies, and poor trophic structure.[237] Asian

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[230] Ex. 428 at 3; Studies throughout the Mississippi River system have shown that Asian Carp have reduced native fish populations, Testimony of R. Garibay, 11/8/10 Tr. at 89.
[231] Ex. 428 at 3
[232] Ex. 428 at 4
[233] Ex. 428 at 2
[234] *State of Michigan v. United States Army Corps of Engineers*, 667 F.3d 765.at 17 (7th Cir. 2011), citing *Asian Carp Possibly Hardier than Once Thought*, Chicago Tribune, Apr. 28, 2011
[235] Ex. 456, Burn and Arthington, *Basic Principles and Ecological Consequences of Altered Flow Regimes for Aquatic Biodiversity,* (2002) at 500
[236] Ex. 428 at 10, 14
[237] Ex. 428 at 10

Carp compound those problems by depriving native fish of food resources because they eat abundantly and indiscriminately.[238] Asian Carp will cause reduced "condition," a term referring to the robustness of fish, because of the reduced food supplies, which will in turn result in a reduced number of eggs being produced and likely an increased susceptibility to disease and predation.[239] The Asian Carp also will cause reduced fish "recruitment," which is the process by which fish move from the egg/larval stage to the juvenile/adult stage.[240] Fish in poor condition produce fewer eggs and lower quality eggs, which reduce the percentage of eggs that hatch, and any fish that manage to hatch are more likely to be ingested by the Asian Carp as part of their indiscriminate feeding strategy.[241] The Illinois Natural History Survey already has documented the adverse effects caused by large numbers of Asian carp on both big mouth buffalo and gizzard shad, which is one of the RAS for the UDIP.[242] But the fact is that most species of fish will likely be affected because they rely on phytoplankton and zooplankton in their early life stage and hence, they are in direct competition with the Asian Carp for this food.[243] Finally, Asian Carp will cause adverse changes in the phytoplankton and zooplankton communities, the base of the aquatic food chain, by their increased consumption of these organisms which surpasses that of native fish.[244]

Asian Carp are already documented to be present in the UDIP and there is no electric barrier to prevent their continued entry. In 2010, the Illinois Department of Natural Resources ("Illinois DNR") collected almost 100 Asian Carp from the UDIP in a large scale sampling effort, and in its more limited fish collection effort in May 2010, EA Engineering also collected

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[238] Ex. 428 at 11
[239] Ex. 428 at 11-12
[240] Ex. 428 at 12
[241] Ex. 428 at 12-13
[242] 11/8/10 Tr. at 152
[243] 11/8/10 Tr. at 157
[244] Ex. 428 at 13

six mature Asian Carp, one of which was loaded with eggs, showing the Asian Carp's ability to spawn in these waters.[245] More recently, in October 2011, the Asian Carp Regional Coordinating Committee reported that an adult Asian (bighead) Carp (35-40 lbs.) was observed in the Brandon Pool, upstream of the UDIP, the first sighting in the past 1.5 yrs. of intensive sampling.[246]

While several strategies are being employed to prevent the Asian Carp from progressing upstream into the CSSC, these efforts are directed at ensuring they do not reach Lake Michigan and not to stop the establishment of a population in the UDIP. Among the Asian Carp controls, some also are causing detrimental effects on the existing UDIP aquatic life. Commercial fishing, which is being used to slow down the spread of Asian Carp into the UDIP and further upstream, also adversely impacts native species.[247] Other control techniques, such as netting, acoustic methods and rotenone, also have an adverse effect on the native populations of fish.[248] All of the other short-term strategies for controlling Asian Carp take place upstream of the UDIP and none are directed at preventing their introduction into this portion of the waterway.[249]

The only "barrier" that has been proposed for the UDIP is intended to herd the Asian Carp into its one small area of relatively good habitat, the Brandon Road Tailwater. The proposed barrier is a "hybrid ABS fish deterrent system," which consists of an acoustical barrier system (ABS) along with strobe lights, and bubble curtains.[250] The system would be installed at the head of the Dresden Pool to divert all Asian Carp into the Brandon Tailwater, for the purpose

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[245] Ex. 428 at 6; 11/8/10 Tr. at 139
[246] Source: "Asian Carp Regional Coordinating Committee, Asian Carp Sampling Summary – Week of October 17, 2011", available at http://www.asiancarp.us/sampling/2011/october17.htm (last checked 2/22/12)
[247] Ex. 428 at 16
[248] Wasik Testimony, 11/9/10 Tr. at 63-69
[249] Ex. 428 at 15
[250] Ex. 428 at 17

of extermination.[251] Referred to as the "disco screen" by the Seventh Circuit in its Asian Carp August 2011 decision, the court noted that while it had not been started, "the Corps represented to us at oral argument that it intends to undertake the project at some location downstream of the existing electric barriers."[252]

The special conditions of the Brandon Tailwater, particularly its isolation from the rest of the UDIP, shallow water depth, and easy to control flow, would allow a cost effective and comprehensive application of piscicides to kill the fish herded into the area.[253] The application of piscicides would take place on a recurring basis triggered by either a showing that Asian Carp are moving upstream or closer to the ABS.[254] Naturally, the regular application of piscicides would also kill all of the other native fish in the Brandon Road Tailwater. It also would negatively impact the ability of the tailwater to serve as a nursery or spawning area because any fish that travel there to spawn might be captured and killed.[255] The use of piscicides also would negatively impact the ability of the Tailwater to serve as a nursery, and as the applications are proposed to occur on an "as-needed" basis, "the entire fish population could be reduced because of the intensive fishing pressure."[256] This new proposed use of the Brandon Tailwater, to help

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[251] Ex. 428 at 17

[252] *State of Michigan v. United States Army Corps of Engineers*, 667 F.3d 765.at 18 (7th Cir. 2011). In December 2011, the Corps issued a report, *Inventory of Available Controls for Aquatic Nuisance Species of Concern, Chicago Area Waterway System* ("Inventory:"), produced by the Great Lakes and Mississippi River Interbasin Study ("GLMRIS") Team. The GLMRIS Team is lead by the Corps and includes various District and Division offices. The Inventory identified over 90 available aquatic nuisance species ("ANS") controls to prevent 39 ANS, including the Asian Carp, from transferring between the Great Lakes and the Mississippi River Basin. The Controls proposed included herbicides, piscicides, sensory deterrent systems (*i.e.,* the "disco screen"), and hydrologic separation. The Inventory noted that only five of the 90 Controls are selective, meaning that the remaining 85 would likely harm any indigenous and/or desirable species. The Inventory stated that the next steps are to develop screening criteria to determine which Controls warrant further consideration, including evaluating the effectiveness of the control, and the best locations for the controls. A complete copy of the Inventory is available at: http://glmris.anl.gov/documents/docs/ANS_Control_Paper.pdf (Last checked 2/22/12)

[253] Ex. 425, Pre-filed testimony of Julia Wozniak at 23-24

[254] 11/8/10 Tr. at 119

[255] 11/8/10 Tr. at 129

[256] 11/8/10 Tr. at 130

stop the northward movement of the Asian Carp, would severely impair any value it currently has as better quality habitat in the UDIP.[257]

Physically separating Lake Michigan from the CAWS is a proposed long-term strategy to control the Asian Carp. Again, the result would be a negative impact on the UDIP because the only source of good quality water in the UDIP is from Lake Michigan.[258] Physical separation will eliminate the only source of high quality water and further exacerbate the existing problems associated with reduced flow, including the lack of fast water and rocky, riffly type habitat.[259]

The direct and physical harm and serious habitat degradation that has occurred and will continue to occur as a result of extensive sedimentation, both toxic and non-toxic, nutrient and other emerging contaminant loadings, barge traffic, and the pending onslaught of the Asian Carp are all human caused conditions that prevent attainment and cannot be remediated or ceased. All of this evidence shows that the requirements of UAA factor 3 have been satisfied to support a finding that the UDIP cannot attain the CWA Goals.[260]

C. Physical Conditions Related to "Natural" Features in both the CAWS and UDIP Preclude Attainment and Satisfy UAA Factor 5

The South Branch of the Chicago River and CSSC segments of the CAWS, along with the Brandon Road Pool and UDIP, share several of the same "physical conditions related to the 'natural' features of the water body" and "unrelated to water quality" that preclude the attainment of aquatic life protection uses within the meaning of UAA Factor 5.[261] UAA Factor 5's reference to "natural" features is placed in quotes here because there is nothing natural about the physical conditions or features of these manmade segments of the CAWS or the Brandon

[257] Ex. 428 at 17. If the plan to herd Asian Carp into the Brandon Tailwater is not sufficiently funded, an alternative plan is to apply rotenone, a piscicide, wherever Asian Carp are present, which certainly will negatively impact all of the fish in the UDIP. 11/8/10 Tr. at 192
[258] Ex. 428 at 19
[259] Ex. 428 at 19
[260] Ex. 366 at 5
[261] 40 CFR §131.10(g)(5)

Road Pool nor are the impounded and channelized features of the UDIP "natural." However, they do constitute "physical conditions" that are "unrelated to water quality" within the intended meaning of UAA Factor 5.

While the extent or severity of such physical conditions are more pronounced in the CAWS segments, these conditions are still present to a sufficient extent in the UDIP that UAA Factor 5 applies. This is particularly true of the lack of adequate habitat in all of these UAA water segments - - the primary factor precluding attainment of the CWA goals.

"Habitat" has been defined as the total chemical and physical environment where organisms live.[262] To attain the CWA fishable goals, an aquatic habitat must have fast water, riffles, hard substrates, and consistent water levels. There must also be a variety of habitats in sufficient amounts to support viable populations of various fish.[263] Not surprisingly, given the man-made nature of, and modifications to, these waterways, which were created and managed primarily for conveyance of wastewater and navigation, there was little or no consideration given to creating fish habitat. The habitat conditions in the CAWS and UDIP are the antithesis of a diverse and healthy aquatic habitat, because of the excessive amount of silt, insufficient amounts of hard substrates, minimal instream cover, and the lack of riffles and fast water.[264]

1. The South Branch of the Chicago River

There is uniform agreement that habitat quality in the South Branch of the Chicago River and the CSSC is poor and will not support Clean Water Act aquatic life goals.[265] Given the recent "tentative agreement" between the Negotiating Parties regarding the proposed designation of the South Branch of the Chicago River as ALU A instead of ALU B, as proposed by the

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[262] Attachment A, UAA Report at 4-1
[263] Ex. 2 of Ex. 366 at 27
[264] Ex. 366 at 7 and Ex. 2 of Ex. 366 at 16
[265] Ex. 2 of Ex. 366 at 19

Agency, particular attention to the evidence presented on the habitat conditions in the South Branch is warranted. In the CAWS "Habitat Evaluation Report and Habitat Improvement Report (Public Comment 284), described as "an extensive and rigorous evaluation of habit[at] conditions in the CAWS", the District and its experts gathered and introduced into the record much of the evidence concerning the poor habitat conditions in the South Branch, along with their findings that habitat conditions in the South Branch were similar to those in the CSSC (which the District apparently still maintains should be ALU B).[266] As presented in Table 7-7 of the CAWS Habitat Evaluation Report, which provides a summary view of the relative differences in physical habitat in the CAWS, the District's expert witness Scott Bell stated that the correct conclusion is that "the [CSSC] and the South Branch Chicago River have the lowest quality of habitat for fish among the major reaches of the CAWS.[267] Both the CSSC and the South Branch of the Chicago River were dominated by tolerant fish species.[268] And further, the District's expert on the Habitat Evaluation Report, Scott Bell, also acknowledged that the report did not account for the effects of the following additional fish community stressors that are all present in the South Branch of the Chicago River: navigation, sediment contamination and flow variability.[269] Particularly with regard to sediment contamination, the District's witness Jennifer Wasik provided testimony showing that the South Branch of the Chicago River is embedded with fine sediments, characterized by visible oil sheens and widespread exceedences of sediment toxicity standards.[270]

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[266] Testimony of S. Bell, 5/16/11 Tr. at 119-120; see also Pre-filed Testimony of S. Mackey, Ex. 457 at p. 3. The District's effort was supported by a number of outside scientists and the completed Habitat Evaluation Report was independently reviewed by three national experts. 5/16/11 Tr. at 120-121
[267] Testimony of S. Bell, 5/16/11 Tr. at 192; Habitat Evaluation Report (PC 284), Table 7-7 at p. 139
[268] Testimony of S. Bell, 5/16/11 Tr. at 210
[269] Testimony of S. Bell, 5/16/11 Tr. at 201
[270] Prefiled Testimony of J. Wasik, Ex. 187 at pp. 5-6

Moreover, although the Habitat Improvement Report noted identified the South Branch as having a higher potential for habitat improvement, Mr. Bell explained in both his prefiled and hearing testimony that the assumptions on which this finding was based could be termed "unrealistic." In particular, for the South Branch, the habitat improvement potential was "largely predicated on the assumption that half of the vertical side walls can be removed and improved, which may not be feasible" as Mr. Bell was not aware of any similar projects of this scope and size ever having been done.[271]

As the Illinois EPA has advised the Board, and as the above evidence shows, there is no scientific or technical basis to support adopting a ALU for the South Branch of the Chicago River which is higher than the ALU for the CSSC. All of the record evidence, including the evidence presented by the District's witnesses, shows that the proposed ALU B use designation should apply to both the CSSC and the South Branch of the Chicago River.

2. The UDIP

While habitat in the UDIP is relatively better than in the CSSC, it is still not good habitat. Put another way, while the South Branch and the CSSC would get an "F" on an exam judging habitat, the UDIP would still only receive a "D." Even Mr. Smogor of the Illinois EPA testified "that the [UDIP] has a lower biological potential than general use waters."[272] The UDIP is a poor habitat, in which only the limited Brandon Tailwater area has some natural features making the Tailwater only a marginally "good" habitat. However, the Brandon Tailwater is not only a very small area, it is isolated from the rest of the UDIP, experiences large fluctuations in water level, is subject to a great influx of wastewater from a large, extensively urbanized metropolis.[273] Plainly stated, "[c]hannelization creates unfavorable stream habitat; the resulting uniform

[271] Prefiled Testimony of S. Bell, Ex. 447 at p. 13; Testimony of S. Bell 5/16/11 Tr. at 199-200
[272] 4/23/08 Tr. at 37
[273] Ex. 2 of Ex. 366 at 29

channel lacks pools, riffles, and boulders or log jams that are essential for sustaining fish abundance."[274] The UDIP simply cannot provide enough good habitat to support a balanced, diverse fish community in the UIDP. Habitat is the main limitation in the waterway, and the quality of the waterway can only get as far as its habitat conditions will allow.[275]

The permanent and irreversible habitat limitations in the UDIP make it incapable of supporting viable populations of a broad spectrum of fish, such as most darters, walleye and sauger, some suckers, most madtoms, and certain minnows and centrarchids.[276] These fish represent moderately tolerant and intolerant species. As the aquatic biology expert Greg Seegert testified, "in order to have a broad spectrum fishes present, you have to have a broad spectrum of habitats available, and those habitats are not available" in the UDIP.[277] The limitations span the gamut of physical, biological, chemical and functional constraints. The limiting physical conditions include the locks and dams, limited shallow bank edge habitat, lack of instream and riparian cover, and lack of suitable substrates. The limiting biological conditions include limited primary productivity, degraded macrobenthic communities and lack of appropriate spawning and nursery habitats. The chemical limitations are legacy contaminants in the sediments. Finally, there are the functional limitations created by navigation, sediment resuspension, and waves from commercial vessels.[278] Just because a very small portion of the UDIP, the Brandon Tailwater, has some better habitat, this does not mean that the rest of the UDIP will ever have the proper habitat required to support a viable and balanced fish community.[279] For all of these

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[274] Ex. 455, Kohler and Hubert, *Inland Fisheries Management in North America, 2nd Ed.*,(1999) at 259. noting that "[a]bundance of sport fishes can be 8-10 greater in natural channels than in channelized parts of the same stream."
[275] 11/17/08 Tr. at 209
[276] Ex. 366 at 12
[277] 11/8/10 Tr. at 189
[278] 11/9/09 PM Tr. at 51-52, 12/2/08 Tr. at 25
[279] Ex. 2 of Ex. 366 at 27

reasons, which have been well documented in this proceeding and confirmed by several expert opinions, the Agency's proposed UDIP Aquatic Life Use is not attainable.

3. The QHEI Scores Show That The Habitat In the Waterways Cannot Attain CWA Goals

In 2003 and 2008, EA Engineering conducted QHEI field surveys of the UDIP. The results of both the 2003 and 2008 QHEI surveys show that the conditions in the UDIP do not support Illinois EPA's proposed aquatic use designation.[280] These field surveys were extensions of QHEI field surveys conducted in 1993 and 1994 by EA. The 1993 and 1994 EA QHEI field surveys were analyzed and used by the authors of the 2003 LDR UAA Report to evaluate the habitat in the LDR. Their observations are noteworthy.[281] First, the LDR UAA Report authors found there were no changes in the UDIP physical habitat since the 1993 and 1994 field surveys.[282] Examining the condition of the banks in the UDIP, the vegetation was indicative of a disturbed community, which included secondary growth and industrial development along much of the river.[283] They noted that much of the quality habitat was in the tailwaters below the dams and at the tributary mouths, while the main channel provided marginal habitat.[284] Reviewing the QHEI scores for the LDR, they concluded that the poor habitat scores recorded throughout the

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[280] The QHEI is the Qualitative Habitat Evaluation Index developed by Ed Rankin in 1989 when he was employed by the Ohio EPA. He used data only from reference sites as a means to minimize the influence of factors other than habitat on the biological scores generated by the QHEI. (5/16/11 Tr. at 135) The QHEI is a simple but robust method of evaluating the physical habitat in streams and is a useful tool because there is a direct relationship between the QHEI score and the quality of the fish community. In other words, the higher the QHEI score the more likely the habitat will support a balanced fish community. The QHEI is composed of six components: 1) Substrate, 2) Instream cover, 3) Channel morphology, 4) Bank erosion and riparian zones, 5) Pool/run/riffle quality, and 6) Stream gradient. There are scoring criteria for each possibility within the components and the sum of the component scores is the QHEI score. Streams that have QHEI scores greater than 60 are capable of supporting fish communities consistent with CWA goals. Streams that have QHEI scores lower than 45 do not support fish communities consistent with CWA goals. The streams with scores between 45 and 60 should be closely examined to determine whether they can or cannot support fish populations. Further discussion of the QHEI can be found in Ex. 2 of Ex. 366 at 20

[281] Attachment A, UAA Report at 4-28

[282] Attachment A, UAA Report at 4-16

[283] Attachment A, UAA Report at 4-12

[284] Attachment A, UAA Report at 4-28

LDR were due to the lack of riffles, limited hard substrates, channelization, poor riparian habitat, lack of in-stream cover, and impounded water.[285] Although a finding of irreversibility is not required under UAA Factor 5, the authors of the LDR UAA Report found that the poor habitat conditions in the UDIP could not be improved without impairing its protected, existing use for navigation, stating:

> [S]tream channelization, lock and dam system, and routine dredging needed to maintain the federal navigation channel plays a major role in affecting the habitat in the Lower Des Plaines River. QHEI scores for the following metrics are controlled by the navigation system:
>
> Substrate (lack of course materials such as gravel of boulders)
> Channel morphology (lack of sinuosity and channel development)
> Pool quality (much of the river is in deep pool)
> Riffle quality (no riffle habitats present)
> Stream gradient (gradient controlled by local dams)
>
> Scores for these categories *cannot be improved without removal or major modifications to the navigation system*. (emphasis added)[286]

The LDR UAA Report acknowledged that commercial use was a protected use under 40 CFR §131, and as long as commercial navigation takes place on the Lower Des Plaines River, changes to the poor habitat features are irreversible.[287] It concluded that the physical habitat formed by the navigation system falls under both UAA Factors 4 and 5, and conditions in both the Brandon Road Pool and the UDIP do not reflect a system that meets the optimum criteria for warm water use.[288]

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[285] Attachment A, UAA Report at 4-30
[286] Attachment A, UAA Report at 4-32. The opinions of the LDR UAA Report authors also were supported by the testimony of the District's aquatic biology expert, Dr. Mackey, in his testimony regarding the adverse effects of dams and the proven benefits of their removal. Dr. Mackey testified that the removal of dams causes significant changes in the substrate conditions of a waterway, particularly downstream, because dams trap a lot of coarse-grained substrate. By restoring the "run of the river" natural flow regime through dam removal, post-dam removal studies documented the creation of new coarse-grained substrates downstream from the dam and the augmentation of aquatic habitat. 5/17/11 AM Tr. at pp. 82-83
[287] Attachment A, UAA Report, at 4-32
[288] Attachment A, UAA Report at 4-32 – 4-33

Clearly, the 2003 UAA Report authors' extensive reliance on the EA QHEI field surveys objectively demonstrates that EA's QHEI procedures and practices produced scientifically accurate and reliable data. The 2003 and 2008 EA QHEI surveys followed the same quality assurance and quality control ("QA/QC") procedures in the hands of well-trained personnel who were very familiar with the UDIP, one of whom is certified by Ohio EPA to conduct QHEI evaluations.[289] It follows that the results of EA's 2003 and 2008 QHEI field surveys are entitled to great weight here, unlike other QHEI scoring introduced in this rule-making that was performed by persons both unfamiliar with the UDIP[290] and whose QA/QC procedures did not withstand scrutiny.[291]

EA Engineering performed QHEI surveys on 50 sites that encompassed the entire UDIP area. The extensive and contiguous nature of the QHEI scoring sites eliminated potential bias that can arise from the selection and scoring of fewer or more limited site locations.[292] Most sites surveyed in the UDIP had a QHEI score of below 60 and many sites scored below 45, meaning almost all of the UDIP is not a good habitat for a healthy fish population consistent with CWA goals.[293] The mean QHEI score for the entire UDIP was 47, well below a score of 60, the level that can support fish communities consistent with CWA goals, and just barely above the score of 45, the level that is deemed clearly incapable of supporting such fish communities.[294] The spatial distribution of the QHEI scores showed that the majority of the habitat in the UDIP is

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[289] In the hands of adequately trained biologists, the QHEI is capable of yielding a reasonable estimate of habitat quality. 5/16/11 Tr. at 145

[290] The crew leader, Alex Johnson, for the MBI's QHEI survey (Attachment S to IEPA Statement of Reasons), had never before conducted a survey on the Lower Des Plaines River. 1/31/08 Tr. at 263-264

[291] Per the MBI's QAPP, Chris Yoder was principally responsible for oversight and management of the MBI QHEI field survey, including participating directly in field sampling. However, Mr. Yoder admitted during his testimony that he did not participate in the sampling effort. 1/31/08 Tr. at 257-258, 262-263). See also, 2/1/08 Tr. at 85-88, 123

[292] Ex. 366 at 9

[293] Ex. 2 of Ex. 366 at 21; 1/28/08 Tr. at 250-251

[294] Ex. 366 at 10

poor or fair.[295] As Mr. Seegert testified to, fair habitat does not equate to Clean Water Act attainment.[296]

Also, it is important to keep in mind that none of the 50 QHEI scores in EA's survey includes sites within the navigational channel area of the UDIP, which is roughly 50% of the UDIP. Because the navigational channel area has no cover and is constantly disturbed by barge traffic, this half of the UDIP would have scored less than 45.[297] The extensive channelized, navigational area of the UDIP greatly reduces the percentage of good habitat in the UDIP.[298] In general, there needs to be approximately 50% or more of good habitat to support a balanced aquatic-life population.[299] In the UDIP, there is less than 10% good habitat, well below the amount needed for a balanced fish community.[300] Even without the benefit of considering EA's extensive QHEI field survey data, the Illinois EPA estimated that only 15% of the UDIP would be classified as "good" habitat under the QHEI.[301] As over half of the UDIP is the navigational channel, an indisputably unsuitable habitat, and the remaining half is mostly poor to fair quality habitat, the UDIP clearly is unable to support CWA aquatic life goals.[302]

The major reasons why the UDIP QHEI scores were low are the a lack of riffle/run habitat, lack of clean substrates (*i.e.,* gravel and cobble), excessive siltation, channelization, poor quality riparian and floodplain areas, and lack of cover.[303] There is very little fast water and, except in the limited Brandon Tailwater area when water levels are low, no riffles.[304] The Illinois EPA gave undue weight to the existence of this very limited area of good habitat in

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[295] Ex. 366 at 10, Attachment 2F of Ex. 2 of Ex. 366
[296] 11/9/09 PM Tr. at 147
[297] Ex. 366 at 10
[298] Ex. 366 at 10
[299] 11/9/09 PM Tr. at 147-148
[300] 11/9/09 PM Tr. at 148
[301] 3/11/08 Tr. at 70
[302] Ex. 366 at 8
[303] Ex. 366 at 8
[304] 11/9/09 PM Tr. at 32

support of its proposed use designation.[305] The Brandon Tailwater is only 7% of the area within the entire Dresden Pool (of which the UDIP is only 8.1 miles of the entire 14-mile long pool).[306] It is isolated and surrounded by predominately poor to fair habitat in the UDIP.[307] The few areas in the Brandon Tailwater that have good habitat are overwhelmed by the poor to fair habitat in the UDIP, which is unable to support most intolerant fish.[308] In the UDIP, there are minimal clean hard substrates, such as gravel, cobble and rubble, sparse cover, contaminated sediments, a lack of fast water and minimal spawning areas.[309] Also, there is considerable and rapid fluctuation in water levels and stream flows and nearly no riffles.[310] The biggest single factor causing all of these conditions and physical limitations is the presence of locks and dams, and unless the locks and dams are removed, the physical limitations will not go away.[311] As Mr. Seegert stated, "[t]his system is not going to attain Clean Water Act goals by any definition that I can think of."[312] The QHEI scores show that without extensive and wide-ranging improvements to the waterway, that would unlawfully impair its protected use for navigation, the UDIP cannot attain the Clean Water Act goals.[313]

4. There is Not, and Will Never Be, a Balanced Fish Community in the CAWS or UDIP

In order to provide for the "protection and propagation of fish, shellfish, and wildlife" consistent with the CWA's aquatic life goals, a waterbody must have a balanced fish population supported by a diverse and healthy aquatic habitat. A balanced fish community has a variety of

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[305] 3/11/08 Tr. at 50
[306] Ex. 2 of Ex. 366 at 27; IEPA Statement of Reasons at p. 17
[307] Ex. 366 at 11
[308] Ex. 2 of Ex. 366 at 11
[309] 11/9/09 PM Tr. at 33
[310] 11/9/09 PM Tr. at 33, 135
[311] 11/9/09 PM Tr. at 34
[312] 11/9/09 PM Tr. at 135
[313] Ex. 2 of Ex. 366 at 19

fish and a good representation of all the trophic levels.[314] The "mere presence of fish provides little information about the condition of a stream," but the information as to the types and numbers of species gives an excellent picture of the water course and its well being.[315] As a basis for proposing that the UDIP could minimally attain the CWA ALU goals, Illinois EPA has repeatedly asserted that the habitat conditions in the UDIP are good enough to support a balanced fish community,[316] claiming that chemical impairments and toxicity are the "missing link" between the UDIP QHEI scores and the even lower IBI scores.[317] But the Illinois EPA has not produced any scientific data to support its contention that the UDIP is capable of supporting a balanced fish community and it essentially ignored the constraints imposed on it by widespread sedimentation, much of which is contaminated, in reaching this conclusion.

The reality is that a balanced fish population does not exist in either the UDIP or the CAWS, and both are incapable of supporting, a balanced fish population that includes habitat specialists. Improved water quality conditions in the waterway have not improved the diversity of the fish community.[318] Since 1993, EA Engineering has made a total of 3,159 collections of fish in three separate studies from the Dresden, Brandon, and Lockport Pools to assess the resident fish populations.[319] The studies show that the aquatic system in these pools is highly stressed and heavily dependent for its diversity on species adapted to its contaminated conditions. They have only a few critical spawning and nursery areas, primarily in the UDIP.[320] The fish communities have been and continue to be characterized by low abundance of most

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[314] CWA §101(a)(2), 11/9/09 PM Tr. at 26, Balanced Fish Community is also defined as a BIP, balanced indigenous population, in 40 CFR125.71(C)
[315] Attachment A, UAA Report at 6-1
[316] 3/11/08 Tr. at 20 and 26
[317] 3/10/08 AM Tr. at 103; 4/23/08 Tr. at 206
[318] 11/9/09 PM Tr. at 29-30, Ex. 366 at 12, Ex. 2 of Ex. 366 at 28
[319] Ex. 366 at 17. The LDR UAA Report favorably references data collected in the EA Engineering fish surveys, indicating its authors found the results to be scientifically credible. *Id.* at 6-3
[320] Ex. 2 of Ex. 366 at 16-17

native fish, low species richness, and domination by highly tolerant species. All of the waterways fell into the "poor" classification under the IWBmod criteria.[321] The fish surveys from 1993 through 2005 for the UDIP and the area of the Dresden Pool below the I-55 Bridge, the "Five-Mile Stretch," showed that sixteen moderately and highly tolerant species were 52.8% of the catch, whereas only 1.7% of the fish collected were intolerant or moderately intolerant.[322] And of those, as Mr. Seegert testified, the intolerant species are "essentially absent."[323] Simple lithophile species, such as walleye, as well as smallmouth bass, both of which require a hard substrate to spawn, are rare or uncommon in the UDIP.[324] There are also reduced numbers of quality prey items in the pools and a lot of the better macro invertebrates are either reduced or eliminated.[325] There were high levels of DELT (deformities, erosions, lesions, and tumors) on the fish collected;[326] and, the most diverse groups of fish species in Illinois, minnows, darters and suckers, were absent, in low abundance, or represented by fewer than expected species.[327]

The fish community composition shows an extremely unbalanced indigenous population.[328] The preponderance of moderately tolerant and highly tolerant fish reflects the degraded habitat of the UDIP and the limited availability of good quality habitat necessary to attain a balanced, indigenous species community.[329] The LDR UAA Report, in comparing the Fox River and the UDIP, concluded that the presence and proximity to dams had significant effects on the fish biotic integrity.[330] Importantly, and contrary to the Agency's contention

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[321] Ex. 2 of Ex. 366 at 17, IWBmod is an Index of Well-Being of fish community health. Attachment 1 of Ex. 2 of Ex. 366 at 5
[322] Ex. 366 at 21 The Five-Mile Stretch is the part of the Lower Des Plaines River below I-55
[323] 11/9/09 PM Tr. at 35
[324] Ex. 2 of Ex. 366 at 30
[325] 11/9/09 PM Tr. at 35
[326] 11/9/09 PM Tr. at 35
[327] Ex. 366 at 12
[328] Ex. 366 at 21
[329] Ex. 366 at 21
[330] Attachment A, UAA Report at 6-25

regarding the cause of the low IBI scores, the LDR UAA Report also found that a contributing reason for the low IBI values in the LDR was the lack of adequate habitat and further concluded that meeting a CWA ALU goal, such as the Ohio "warmwater habitat" use designation, was not feasible because of the artificial modifications in the stream channel.[331] Thus, the physical habitat metrics and the fish data agree with each other, indicating the importance of habitat to the fish and refuting the Agency's claim that the IBI values indicate the capability of supporting a better quality fish community.[332]

5. The MBI QHEI and IBI Scores are Seriously Flawed and Unreliable

Illinois EPA relied on the QHEI scores generated by the Midwest Biodiversity Institute ("MBI") in determining that the UDIP was "minimally" able to attain the CWA goals.[333] However, that reliance was misplaced. A closer review of MBI's work and resulting QHEI scores reveals that they are seriously flawed and unreliable.[334] Such flawed and unreliable data does not satisfy the UAA requirement for a "scientific assessment" pursuant to 40 CFR 131.3(g).

First, for evaluating the physical habitat conditions in the UDIP, the MBI QHEI field survey was too limited to be able to present anything approaching an adequate and representative assessment of the UDIP. The MBI's QAPP for the QHEI survey called for the inclusion of 20-25 site locations in the Lower Des Plaines between Lockport to downstream of the Kankakee, but MBI did not follow the QAPP and instead included in its survey only a total of 23 sites overall.[335] Of these, only three of them (about 13%) were in the UDIP.[336] Over half of the QHEI

[331] Attachment A, UAA Report at 6-25
[332] 11/17/08 Tr. at 109
[333] 1/28/08 Tr. at 77
[334] Ex. 366 at 13; Ex. 2 of Ex. 366 at 21-25
[335] 2/1/08 Tr. at 67-69
[336] Ex. 366 at 17-18; 2/1/08 Tr. at 70-73. The MBI QHEI Survey leader, Mr. Yoder, was so unfamiliar with the LDR that he was unable to identify on a map where these sites were located. 2/1/08 Tr. at 70

sampling locations in the MBI study were not even within the waters that are a part of this rulemaking.[337]

Of the only three UDIP sites that were sampled by MBI, one was in the Brandon Tailwater, thus giving the false impression that the limited area of tailwater habitat represents about a third of the entire UDIP and hence, that the UDIP habitat is better than it really is. Also, there was no showing that the three QHEI sites in the UDIP were proportionately representative of the UDIP conditions, having been selected in part by persons who had no prior QHEI survey or other adequate familiarity with the UDIP.[338] During the hearing testimony, it became clear that due to the MBI's failure to adhere to QAPP requirements, just where these three QHEI sites were located in the UDIP could not even be determined.[339] This dilutes the results and makes them even more suspect.[340]

Second, MBI made numerous mistakes in calculating the QHEI and IBI scores. A detailed description of the multiple and significant errors in the MBI QHEI scoring is described in the EA Engineering, Science, and Technology's Report on the Aquatic Life Use Attainability Analysis, but several are summarized here.[341] Most basically, MBI made math errors when adding up the individual metric scores for a given site.[342] It also made a number of methodological errors, such as incorrectly interpreting current speed, ignoring the obviously impounded nature of sites, not properly accounting for channelization, over-scoring cover types

[337] Mr. Yoder testified that nine of the sampling stations were within the Illinois River. 2/1/08 Tr. at 69. Further, as Mr. Yoder was not familiar enough with the waterway system to identify specific locations, Mr. Smogor testified that three more were outside the LDR UAA, leaving only six sampling stations within the LDR UAA, three of which were within the UDIP and the other three in the Brandon Pool. 2/1/08 Tr. at.70-73. 11/9/09 PM Tr. at 23

[338] 2/1/08 Tr. at 75. None of the Illinois EPA personnel who testified in the UAA hearings were present during the QHEI work by MBI and hence, could not express any view on the representativeness of the site selection. 2/1/08 Tr. at 81. Although MBI got some assistance from a U.S. EPA employee in the site selection process, Mr. Yoder did not know what that was based on either. 2/1/08 Tr. at 122

[339] 2/1/08 Tr. at 79-88. Mr. Yoder did not know whether a detailed plan of study for selection of sampling sites was prepared, as required by the QAPP (*Id.* at 88) and while he agreed to look for it, no such plan was ever produced.

[340] 11/9/09 PM Tr. at 23

[341] Ex. 2 of Ex. 366

[342] See, *e.g.*, 2/1/08 Tr. 62-63, 106, 153

and amounts, incorrectly assessing riparian width, and erroneously considering some areas to have some sinuosity when there was none.[343] Many of these errors were brought to light during the hearing questioning of MBI witness Chris Yoder, who was the titular "principal investigator and project coordinator" of the MBI QHEI work but unexplainably was absent from the field.[344] MBI subsequently submitted revised versions of its QHEI scores, the third version of which is Exhibit 37, in an attempt to correct all of the previously identified mistakes.[345] However, the third version introduced new mistakes, such as giving some riparian areas a score of 11 even though this metric only goes to a maximum score of 10.[346] MBI's errors resulted in a systematic scoring inflation that gives the wrong impression that habitat in the UDIP (and elsewhere) is better than it really is.[347]

The 2006 MBI Index of Biological Integrity (IBI) metric values and scores are equally unreliable because they contain numerous mistakes in tabulation and calculation of the IBI factors.[348] The original MBI IBI scores included multiple mistakes including identifying non-native species as part of the species richness metric and incorrectly assigning species to breeding guilds.[349] All of the MBI sites were assigned the same drainage area even though the drainage areas varied widely. Because IBI metric scores can vary depending on the drainage area, an unknown number of MBI's IBI scores are incorrect and unreliable because they are not based on the correct drainage area.[350] Improper or inadequate QA/QC procedures resulted in pH and

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[343] Ex. 366 at 13
[344] 1/31/08 Tr. at 253
[345] 11/10/09 AM Tr. at 54
[346] 11/10/09 AM Tr. at 54
[347] Ex. 366 at 13. Further, in yet another deviation from the QAPP requirements, the UAA stakeholders were not given any opportunity to make inspections and audits of the field sampling, equipment and result, as provided in § C (1) of the QAPP. 2/1/08 Tr. 146. Further, the MBI QHEI Report (Attachment S to IEPA Statement of Reasons) was never shared with any of the UAA stakeholders prior this rule-making, 1/28.11 Tr. at 264
[348] Ex. 2 of Ex. 366 at 26; 2/1/08 Tr. 106, 153
[349] Ex. 2 of Ex. 366 at 26, Ex. 366 at 13-14
[350] Ex. 2 of Ex. 366 at 26

dissolved oxygen probes that were not operating properly and hence, recorded unrealistic pH and dissolved oxygen values, as admitted by Mr. Yoder during his testimony.[351] Finally, MBI incorrectly included exotics or hybrids in the scores and misidentified fish for tabulation in metrics, other mistakes also acknowledged by Mr. Yoder in his testimony.[352]

This consistent pattern of errors by MBI continued in its fish survey work, making that work as inaccurate and unreliable as its QHEI and IBI scores. The fish surveys incorrectly identified fish, particularly misidentifying generalists as specialists and including exotics, which resulted in a distorted portrayal of a more balanced and diverse fish community than actually exists.[353] Fish species were misidentified and MBI was unable to provide voucher specimens of species whose proper identification was in question. In some cases, MBI provided photographs of the correct species but the photographs were taken of specimens collected elsewhere, thus providing no evidence that the identifications made by MBI in the CAWS/UDIP were accurate..[354] The mistake-riddled QHEI, IBI and fish survey work by MBI renders all of their conclusions unreliable and at best suspect.[355]

The limited MBI surveys and reports are not a scientifically defensible basis on which to refute the overwhelming evidence presented by MWGen's experts and others that show the UDIP does not have adequate good habit to support an aquatic community that is capable of attaining the CWA ALU goals. Because of its limited duration, scope and quality issues, the MBI work provides an unrepresentative and distorted picture of conditions in the UDIP. In fairness to the Illinois EPA, it appears it was not aware of the deficient nature of MBI's work when it relied upon it in reaching its aquatic life use determination for the UDIP. It was only

[351] 2/1/08 Tr. at 152, Ex. 366 at 13
[352] 2/1/08 Tr. at 128-129
[353] Ex. 2 of Ex. 366 at 28; see also 2/1/08 Tr. at 127-136, 139
[354] Ex. 2 of Ex. 366 at 28
[355] Ex. 2 of Ex. 366 at 28

after extensive cross-examination that the MBI witness Mr. Yoder finally admitted that MBI had not followed the quality assurance procedures (the "QAPP") applicable to its work, after initially testifying otherwise.[356] The hearing record establishes that the MBI data is not accurate and any conclusions based on it should be disregarded.[357] In short, MBI was sloppy from the beginning of its evaluation of the UDIP to the submission of their reports.

In stark contrast to MBI's work, the picture presented of the UDIP by EA Engineering's work is a complete and representative one, based on 20+ years of fisheries data and multiple, extensive QHEI surveys performed by adequately trained personnel familiar with the waterway. EA Engineering's extensive work in the UDIP and in its vicinity is representative, accurate and reliable; fully measuring up under the scrutiny brought to bear upon it in this proceeding. The EA Engineering data and conclusions, as well as other consistent evidence presented to the Board in this proceeding from other sources, are together clearly sufficient to rebut any presumption that the UDIP is capable of attaining the CWA fishable goals.

6. Silt Is a Major Stressor to The Creation Of a Proper Habitat

The prevalence of silt is another major habitat limitation in the UDIP because it prevents an adequate exchange of oxygen in bottom materials, and fills in the interstitial spaces preventing their use by fish, especially larvae and small juveniles and the benthic prey items they rely upon.[358] Silt is a fine-grained sediment material that is easily suspended in the water column, and when the water slows, settles out, sometimes in dense layers.[359] IEPA's witness Mr. Yoder testified that "silt is not biologically a good substrate, in fact it can be detrimental."[360] Silt

[356] 1/31/08 Tr. at 258, 263
[357] Ex. 366 at 14
[358] Ex. 2 of Ex. 366 at 16
[359] Ex. 2 of Ex. 366 at 29
[360] 2/1/08 Tr. at 40

is mostly mineralized and composed of a lot of clay material, which makes it detrimental because it sticks to everything.[361]

The physical conditions and functions of the UDIP increase the accumulation of silt in the system.[362] The pool levels in the system, including the UDIP, are artificially maintained at near-constant levels during dry weather to aid commercial navigation.[363] The artificially-maintained flow regime of the UDIP exacerbates siltation because it does not allow for flushing of the silt down the waterway, which normally occurs in rivers seasonally in the late winter or early spring.[364] Also, the dams in the system cause sediments, some of which are toxic, to settle out behind them, constantly replenishing the sediments already within the system.[365] Finally, barge traffic regularly re-suspends silt and sediment as barges repeatedly travel through the system.[366]

Evaluations of the silt in the system have consistently showed that there is heavy siltation throughout the UDIP and that it is not improving. In 2003, the Dresden Pool had moderate to heavy siltation at 72% of the locations sampled, and 59% of the locations showed moderate or extensive embeddedness.[367] Similarly, in 2008, siltation was moderate to heavy in 66% of the locations sampled, and moderate to extensive embeddedness was found in 66% of the locations sampled. At 12 of the 50 locations sampled in 2008, silt or detritus was the only substrate type found.[368]

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[361] 2/1/08 Tr. at 40-41
[362] Ex. 2 of Ex. 366 at 29
[363] Ex. 2 of Ex. 366 at 29
[364] Ex. 2 of Ex. 366 at 29
[365] Ex. 2 of Ex. 366 at 29
[366] Ex. 2 of Ex. 366 at 29
[367] Ex. 2 of Ex. 366 at 30. "Embeddedness" is the degree that gravel, cobble, or boulder substrates are surrounded by fines (*i.e.*, sand and silt)
[368] Ex. 2 of Ex. 366 at 30

The adverse effects on aquatic life caused by excessive silt are well-established. Silt reduces biodiversity by making areas unsuitable for spawning, reducing hatching success, and reducing macroinvertebrate diversity, which reduces prey availability for fish.[369] Simple lithophiles are fish that broadcast their eggs randomly over the substrate, and the eggs develop in the interstitial spaces between the clean hard substrates. For the eggs to hatch successfully, there has to be good aeration and circulation, and if the interstitial spaces fill with silt and sediment, then there will not be adequate hatching because the eggs smother and die.[370] A specific example of this is walleye,, which could live in the system; however, because of the massive amount of silt in the system, there is not enough hard substrate of rock and cobble to adequately support a population.[371] Other aquatic biota adversely impacted by high levels of silt are "high quality" invertebrates, such as mayflies and stoneflies. These have a need for a highly oxygenated environment, which is not achievable when there is excessive siltation.[372] As the "high quality" invertebrates are prey for many of the fish necessary to achieve a balanced fish community, their reduced population in the UDIP due to siltation adversely impacts the food resources for the fish communities.[373]

The documented, widespread presence of excessive silt in the UDIP is indisputable and provides yet another reason why UAA Factor 5 applies here. The Illinois EPA either did not consider the UDIP silt data or did not appreciate the adverse ramifications on aquatic life that are a direct consequence of the UDIP silt conditions. The silt conditions in the UDIP are clearly a constraint or stressor that prevents it from even "minimally" attaining the CWA ALU goals.

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[369] Ex. 2 of Ex. 366 at 29
[370] 11/9/09 PM Tr. at 60
[371] 11/9/09 PM Tr. at 28
[372] Ex. 2 of Ex. 366 at 16
[373] Ex. 2 of Ex. 366 at 16

7. The Urbanized Nature Surrounding the CAWS and UDIP Prevents the Waterways from Attaining the CWA Goals

Another major, as well as irreversible, factor that contributes to preventing the CAWS and UDIP from attaining the CWA goals is that the area around the waterway system is extensively urbanized. There is a strong inverse relationship between the amount of urbanization and the various biological measures, under any of the various measures of the extent of urbanization (*e.g.*, percent urban area, percent impervious area, population and density). This is also true regardless of the biological metric used in the analysis (*e.g.*, IBI scores, fish and macroinvertebrate taxa richness, and macroinvertebrate community index scores).[374] The Illinois EPA significantly downplayed the adverse effects caused by stormwater run-off in this highly urbanized area, calling it a "drop in the bucket" and an insignificant stressor because first flush of water run-off is starting to be captured by TARP and more will be when it is completed.[375] Yet, Illinois EPA agreed that not all of the storm water run-off will be completely captured by TARP before it flows into the water.[376] Illinois EPA provided no explanation of how TARP, which does not extend down to the UDIP area, will prevent the continuing storm water run-off from the increasingly urbanized Will County area.

Studies have shown that biological measures significantly decline when the percent impervious area reaches 10-20% or the percent urban area is 8-50%.[377] In 1997, the percent impervious area for the Des Plaines Basin ranged from 30.1-56.4%, which far exceeds the threshold negative impact on biological measures.[378] Also, in 1990, 58.7% of the area in the Des Plaines subbasin was classified as urban. Since that time, there has been significant

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[374] Ex. 2 of Ex. 366 at 30
[375] 4/23/08 Tr. at 233-234
[376] 4/23/08 Tr. at 234
[377] Ex. 2 of Ex. 366 at 30-31
[378] Ex. 2 of Ex. 366 at 31

development, particularly in the Joliet area, and growth has been greatest in the counties surrounding Chicago.[379] The domination of the Des Plaines watershed by urban development has increased steadily and will likely continue long-term, and thus, the current percentage urbanization is likely significantly higher.[380] Regardless, the 58.7% urban area reached twenty years ago in this area is greater than all thresholds for when a significant effect on biological factors occurs.[381] Given its highly urbanized setting, and considering the presence of all the other limiting physical conditions discussed above, attaining the CWA goals is virtually impossible in a highly urbanized area like the UDIP.[382]

A study by the Illinois EPA's own witness, Mr. Yoder, also concluded that biological measures significantly decline as urbanization increases. In a 1996 paper, he reported that 85% of the urban sites sampled had poor to very poor biological index scores, meaning they were non-attaining.[383] Further, Mr. Yoder stated in a 1999 paper: "[T]he recent finding that no urban headwater stream sites in the Ohio EPA database attain the [Warm Water Habitat (WWH)] biocriteria (*Yoder and Randkin 1997)* only serves to further the notion that the degree of watershed urbanization can preclude the WWH use regardless of the site specific habitat quality."[384] Mr. Yoder stated in a subsequent paper that only a very few sites exhibited attainment at urban land uses between 40-60% and none over 60%.[385] Those that exhibited attainment had either an intact, wooded riparian zone, a continuous influx of groundwater, and/or the urbanization was relatively recent (*i.e.*, there had not yet been enough time to realize its

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[379] Attachment 1 of Ex. 369 at 6
[380] Attachment 1 of Ex. 369 at 6
[381] Ex. 2 of Ex. 366 at 31
[382] Ex. 2 of Ex. 366 at 30
[383] Ex. 2 of Ex. 366 at 31
[384] Ex. 2 of Ex. 366 at 31 quoting Yoder, C.O., R. Miltner, and D. Whiate. 1999. Assessing the Status of Aquatic Life Designated Uses in Urban and Suburban Watersheds. Pages 16-288 in R. Kirschner (ed.) National Conference on Retrofit Opportunities for Water Resources Protection in Urban Environmental. EPA/6325/R-99/002 at p. 25
[385] Ex. 2 of Ex. 366 at 31

adverse effects). None of these factors are applicable to the UDIP. Mr. Yoder further found that "the results also suggest[ed] that there is a threshold of watershed urbanization (*e.g.*, >60%) beyond which attainment of warmwater habitat is unlikely."[386] The percent urbanization in the Des Plaines River watershed was 58.7% almost 20 years ago and has clearly increased since then. With none of the biological ameliorating factors identified by Mr. Yoder being present, there is no basis on which to conclude that mitigation of the negative effects of urbanization in the Des Plaines watershed, CAWS and UDIP is occurring.[387]

The conclusions of Mr. Yoder's study also rebut the Illinois EPA's unsupported assumption that the perceived "gap" between IBI and QHEI scores in the UDIP is due to point source discharges from MWGen and others. Mr. Yoder found that IBI values in the watersheds studied declined significantly when the amount of impervious cover exceeded 13.8% and fell below CWA goals when impervious cover exceeded 27.1%.[388] In 1997, before the housing and construction boom of the next several years, the percent impervious cover in the Des Plaines Basin was already 30-56%.[389] Most importantly, the poor biological conditions observed by Mr. Yoder in other studies occurred regardless of site-specific habitat-quality. In other words, in highly urbanized areas, even streams with good habitat and high QHEI scores, unlike the UDIP, often failed to attain CWA goals.[390]

The Illinois EPA did not conduct a sufficiently thorough review of the effects of urbanization, including urban run-off, on the UDIP. Its review was biased by its belief that it was point source effluent discharges that were preventing the UDIP from attaining the CWA

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[386] Ex. 2 of Ex. 366 at 31 quoting Yoder, C.O., R.J. Miltner, and D. White. 2000. Using Biological Criteria to Assess and Classify Urban Streams and Develop Improved Landscape Indicators. In Proceedings of the National Conference on Tools for Urban Water Resource Management and Protection. Published by U.S.EPA, Office of Research and Development. Washington D.C. EPA/625/R-00/001
[387] Ex. 2 of Ex. 366 at 32
[388] Ex. 2 of Ex. 366 at 32
[389] Ex. 2 of Ex. 366 at 32
[390] Ex. 2 of Ex. 366 at 32

goals. As the Agency admitted, it "didn't focus our energies on [nonpoint sources] because this is an effluent-dominated waterway."[391] But in 2003, just a few years before the Illinois EPA concluded that the UDIP was "minimally" capable of attaining the CWA goals, its Director of Water, Marsha Wilhite, reported that urban run-off is a significant cause of impairment in the UIW, and the impairments are greatest in the Des Plaines River.[392] Layered upon the documented habitat and other physical limitations present in the UDIP, the above scientific studies and the Agency's own prior findings all consistently support the conclusion that the UDIP will not achieve the CWA aquatic life goals because of the high percentage of urban land use and impervious area present.[393]

Poor habitat and the resulting poor quality fish communities, as well as the constant accumulation of silt and increased urbanization of the Des Plaines watershed, limit the ability of both the CAWS and the UDIP to attain the CWA goals. Thus, UAA Factor 5 is satisfied and the proposed UDIP ALU should be rejected and replaced by MWGen's proposed use designation that accurately describes the lower, but actually attainable, aquatic life use for the UDIP.

VII. Thermal Conditions are not Preventing Attainment of the Fishable Use

The evidence in this proceeding persuasively demonstrates that the limiting physical and biological conditions, along with sediment contamination and protected commercial navigation, in the UDIP are the reasons it cannot attain the CWA goals. All of these conditions are wholly unrelated to thermal discharges by Midwest Generation.[394] The record here demonstrates that it is conditions outside the influence of the Midwest Generation thermal discharges that prevent the attainment of the fishable designated use.

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[391] 1/28/08 Tr. at 107-108
[392] 1/14/10 AM Tr. at 75-76, *citing* Wilhite, M, 2003, Urban Stormwater Issues in the Illinois River Basin in Illinois Water Resources Center, editor, 2003 Governor's Conference on the Management of the Illinois River System, the Illinois River: Sharing the Visions. Ninth Biennial Conference Proceedings Special Report No. 29 Urbana, IL
[393] Ex. 2 of Ex. 366 at 32
[394] 11/9/09 PM Tr. at 51

The Illinois EPA's "feeling" that by reducing thermal point source discharges, such as the thermal discharges from the Midwest Generation Joliet Stations in the UDIP, the UDIP will be able to attain the CWA goals is contrary to the weight of the evidence presented in this rule-making and unsupported by credible and reliable technical and/or scientific data.[395] Thermal levels in the UDIP are not a primary constraint to its attaining a higher aquatic life use. Separate and apart from any thermal impacts, the fact that the other many limiting conditions in the UDIP satisfy several of the UAA Factors shows that it is these conditions that prevent the UDIP from attaining the CWA aquatic life goals.[396] As the Illinois EPA's Roy Smogor admitted in his testimony "If you fix the temperature, the aquatic life use may not show a response, because there are other factors, then, that kick into place."[397]

As a preliminary matter, it is simply wrong to ascribe all of the thermal conditions in the UDIP to the Midwest Generation thermal discharges. The physical conditions of the upstream CAWS UAA waters segments and the effluent-dominated nature of the waterway also contribute to its thermal regime. Temperature in the waterway, including the UDIP, is largely influenced by upstream flow manipulations, particularly during summer months.[398] When the flow is low and the ambient air temperature is high, the waterway picks up heat quickly as it slowly moves downstream and very little ambient cooling occurs. Conversely, when there are large flushing events caused by flood controls and CSO discharges, the huge glut of water dilutes the effects of any heat inputs into the system both from solar and other sources.[399]

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[395] 1/28/08 Tr. at 131
[396] 11/9/9 Tr. at 50-52. As Mr. Seegert testified, "the weight of the evidence points directly in a different direction." Id. at 52.
[397] 1/28/08 Tr. at 172
[398] 11/9/09 AM Tr. at 86
[399] 11/9/09 AM Tr. at 86-87

There is not a simple relationship between temperature and aquatic toxicity, because both low and high temperatures can increase and decrease toxicity due to exposures from other chemical stressors.[400] The Illinois EPA speculated that if the temperature were decreased in the UDIP, the IBI values would improve, but provided no data to support a finding that any such improvement would be sufficient to overcome the other physical and biological constraints that prevent the UDIP from attaining the CWA ALU goals.[401] The Illinois EPA witnesses testified that lower temperatures could benefit "species that are barely subsisting" who would "*probably* [show up] in greater numbers."[402] But there was no evidence presented to support these contentions, including whether the necessary habitat was present to support these species or if they could sustain a population when faced with the other constraints (*e.g.,* siltation, contaminated sediments, controlled flow regimes) present in the system.

The Illinois EPA's contention that temperature is the primary stressor on the UDIP also conflicts with its prior statements concerning the limiting conditions in the UDIP.[403] Before this proceeding, the Illinois EPA never identified temperature as a limiting factor to attainment of beneficial uses or as a cause of impairment.[404] In fact, the Illinois EPA advanced the opposite view in the previous AS96-10 Adjusted Standard Board proceeding. The Agency then informed the Board that there was a "likelihood of no improvement to the aquatic community" if a cooling tower and spray ponds were added to reduce the temperature of the Joliet Station discharges.[405] Given that conditions in the UDIP have not significantly changed since the AS96-10 proceeding,

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[400] Ex. 369 at 12, Attachment 11 of Ex. 364, at p. 6
[401] 3/11/08 Tr. at 113-115
[402] 3/11/08 Tr. at 114 (emphasis added)
[403] 3/11/08 Tr. at 117
[404] Ex. 369 at 11
[405] *In the Matter of: Petition of Commonwealth Edison Company For Adjusted Standard From 35 Ill. Adm. Code 302.211(d) and (e),* AS 96-10, October 3, 1996 at 7; See also Ex. 364 at 6, citing *Response of the Illinois EPA to the Amended Petition of Commonwealth Edison Company Adjusted Standard from 35 Ill. Adm. Code 302.211(d) and (e)",* AS 96-10, at 7, 9

there is no credible or scientific basis for the Illinois EPA's complete reversal of position on this issue.

The Board should again find today, as it did in its AS96-10 Opinion, that "other factors continue to override the effect of temperature on the waterway. These overriding factors include loss of habitat due to channelization, disruption of habitat due to barge traffic, and the presence of heavy metals and other pollutants in the system."[406] The evidence in this UAA rule-making indisputably shows that the relevant limiting factors cited by the Board in the AS96-10 proceeding have not changed. There is still loss of habitat due to channelization, disruption of habitat due to barge traffic and, as the sediment sampling evidence presented in this proceeding shows, the UDIP is still contaminated by heavy metals and other pollutants.

Further evidence that temperature is not preventing the UDIP aquatic community from achieving a balanced, indigenous population consistent with the CWA's goal was presented in the results of the extensive fish surveys that have been performed in the Dresden Pool over the period from 1993 to 2008.[407] Time and again, these surveys found no evidence that the thermal discharges from the power plants were the cause of the limited fish diversity present and concluded that the aquatic community would essentially be the same if the Midwest Generation (f/k/a ComEd plants) were taken off line.[408] Similarly, based on the study data introduced in the AS96-10 Adjusted Standard proceeding, both the Board and the Agency agrees that heat was not a factor limiting the quality of the aquatic habitat of the Five-Mile Stretch below the I-55 Bridge

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[406] *In the Matter of: Petition of Commonwealth Edison Company For Adjusted Standard From 35 Ill. Adm. Code 302.211(d) and (e),* AS 96-10, October 3, 1996 at 6, Ex. 364 at 6, citing, *In the Matter of: Proposed Determination of No Significant Ecological Damage for the Joliet Generating Station*, PCB 87-93, November 15, 1989, at 20; Response of the Illinois EPA to the Amended Petition of Commonwealth Edison Company Adjusted Standard from 35 Ill. Adm. Code 302.211(d) and (e) filed in AS96-10, Aug. 9, 1996 at 5, 9-1

[407] Ex. 366 at pp. 17-21, Attachment 1 (Detailed Summary of EA Engineering, Science and Technology's Stream Surveys for the Upper Illinois Waterway (UIW), 1993-2006 and Exhibit 2 (EA Report on UAA ALU)

[408] Ex. 366 at pp. 20-21 and Attachment 1

in the Dresden Pool.[409] (In this regard, it is important to note that the AS96-10 Adjusted Standards (applicable at the I-55 Bridge) are identical to the General Use numeric thermal standards for January-February, within 1°F for June-August, and more stringent for April, May 1-15, October –November. March and December are the only months when the Adjusted Standard allows a temperature up to 65°F, compared to the General Use standard of 60°F.[410]) Further, the study results before and after the AS96-10 Adjusted Standard went into effect show the lack of any significant impact (positive or negative) from the AS96-10 Standard on the fish community. From 1997-2005, EA Engineering made 1,310 fish collections from the Dresden Pool alone.[411] The same 10 species dominated the UDIP and the 5-mile Stretch below the I-55 Bridge with only a modest improvement in some measures noted in the UDIP.[412] This abundant, scientific data is clearly sufficient to rebut the unsupported contention that temperature levels in the UDIP are preventing it from attaining a balanced, indigenous population that meets the CWA's fishable goal.

In contrast, the Illinois EPA largely relies upon the LDR UAA Report to support its position regarding thermal issues.[413] However, the LDR UAA Report contains numerous erroneous interpretations of data and conclusions regarding thermal impacts in the UDIP in order to support the authors' biased view that temperature levels in the UDIP were lethal to fish - - a view that is uncorroborated by actual data, such as any evidence of fish kills due to these supposedly "lethal" temperatures. Even the Illinois EPA rejected these conclusions, testifying that "the Aquanova report…misspoke when they said that there was [sic] lethal temperatures."[414]

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[409] Ex. 364, Pre-filed Testimony of Julia Wozniak, p. 6
[410] *Id.* at p. 7-8
[411] Ex. 366, Pre-filed Testimony of Greg Seegert, Attachment 1 at p. 9
[412] *Id.* at 10-11
[413] Ex. 1, Pre-filed Testimony of Rob Sulski, p. 10, 18, 3/11/08 Tr. at 86-87
[414] 3/11/08 Tr. at 89

In the more than 20 years since MWGen and its predecessor have been studying the fish populations in the UDIP and CAWS, there has not been a fish kill under the prevalent thermal conditions.[415] Similarly, MWGen has provided data showing that the fish species the LDR UAA Report authors claim could not survive in the LDR because of the thermal conditions are well represented in the area.[416]

The LDR UAA Report wrongly implies that the Secondary Contact Use maximum thermal standard of 100° F was often present in the main body of the LDR. The LDR UAA Report's authors attempted to support this claim by misrepresenting what were end-of-pipe discharge canal temperature data from the MWGen Joliet 29 Station as instead being data collected from the main body of the river.[417] The Illinois EPA's witness Scott Twait corrected this error in his hearing testimony, clearly stating that the data relied upon in the LDR UAA Report was the wrong data and "did not take into account any…temperature attenuation in the Canal, nor did it take into account any use of the cooling towers."[418] Further, there were erroneous statements throughout the LDR UAA Report regarding the maximum temperature in the UDIP during the summer, only some of which were corrected in a subsequent filing (see, *e.g.*, the *Temperature* Chapter 2 of the LDR UAA Report). Even this limited correction to the LDR UAA Report's errors on temperature only occurred after MWGen presented both extensive UDIP in-stream thermal data and showed that the data the LDR UAA Report authors relied upon were instead the maximum monthly condenser outlet temperatures at the Joliet 29 Station.

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[415] Attachment 11 of Ex. 364 at 7-8
[416] Testimony of Julia Wozniak, 11/9/09 Tr. at 102-103
[417] 1/13/10 AM Tr. at 104
[418] 1/28/08 Tr. at 136-137

Maximum monthly condenser outlet temperatures clearly are not representative of either the discharge to the LDR or temperatures in the main body of the river.[419]

Dr. Allen Burton, one of the authors of the Wright State Study, testified to describe how the LDR UAA Report authors had mischaracterized that study in an attempt to muster support for their erroneous claim that thermal conditions, and not physical and biological conditions, prevent the UDIP from attaining the CWA ALU goals. Dr. Burton testified that the Wright State Study did not attempt to establish temperature limits for the UIW nor was it done in furtherance of that purpose. The correct scope and findings of the Study were that acute toxicity exists in short-term exposures for multiple species in waters and sediments without any increase in water temperature and that both cold and hot temperatures increase toxicity.[420]

The LDR UAA Report mistakenly reported that that the secondary contact thermal limits are too high for fish to survive, when in fact fish are not only surviving, but those tolerant of the poor habitat and other limitations in the system are found in abundance in the LDR.[421] There is no mass migration of fish downstream in the summer months, nor are younger fish killed by higher temperatures.[422] The LDR UAA Report states that high temperatures create blue-green blooms in waterways but provides no support for this statement nor does it provide any evidence that such blooms occur in the system.[423]

Another example of the LDR UAA Report's biased review of thermal conditions in the UDIP is its complete failure to acknowledge that low dissolved oxygen (DO) levels in this

[419] Attachment 8 to Ex. 364, October 15, 2003 Midwest Generation Comments on Revised Draft Thermal Section of the Lower Des Plaines River UAA Report, Attachment 11, March 24, 2004 Midwest Generation Letter to IEPA, Comments on Final Lower Des Plaines UAA Report, at 4-5
[420] Ex. 369 at 12
[421] 11/9/09 AM Tr. at 103
[422] 11/9/09 AM Tr. at. 103, Attachment 8 to Ex. 364 at p. 16
[423] Attachment 1 of Ex. 369 at 16, Attachment 8 of Ex. 364 at p. 10

waterway are primarily associated with CSO events, not high temperatures.[424] When the Illinois EPA provided and introduced into the hearing record its data on fish kills in the UIW, it showed that the low DO episodes associated with these fish kills were all related to CSO events and not to temperature.[425]

Temperature is not the limiting factor in the UDIP that prevents it from attaining the CWA ALU goal, just as it is not the limiting factor in the South Branch of the Chicago River, the CSSC or the Brandon Road Pool. Relevant to this issue are the findings of the District's Habitat Evaluation Report regarding temperature. Based on a regression analysis of fish data with temperature data from the CAWS collected between 2001 and 2007, the authors of the Habitat Evaluation Report (Limnotech) concluded that temperature was a poor predictor of fish data and very little of the variability in the CAWS fish data showed statistically significant correlations to temperature data.[426] Even when Limnotech compared twelve different fish metrics with the percentage of time the daily maximum temperature exceeded the Illinois EPA's proposed maximum thermal standard, it did not find any significant correlation with temperature.[427] Additional Limnotech comparisons between fish metrics and temperature levels that exceeded the Agency's proposed thermal standards here also either failed to find a statistically significant relationship or anything more than a relatively weak relationship between the two.[428] Relying on all of this analysis, Limnotech agreed that temperature was not a strong indicator of fish health in the CAWS.[429] Based on the extensive data Limnotech collected on the CAWS, Limnotech concluded that "incremental improvements in water quality alone may have at best a small

[424] EX. 65, Prefiled Testimony of Samuel Dennison, at 4 and Attachment 3
[425] Ex. 47
[426] Habitat Evaluation Report (PC 284) at p. 57; 5/16/11 Tr. at 156-157
[427] Habitat Evaluation report (PC 284) at Appendix C, Table 3-1; 5/16/11 Tr. at 161-162
[428] Habitat Evaluation report (PC 284) at Appendix C, Tables 3-2, 3-3 and 3-4; 5/16/11 Tr. at 162-163
[429] 5/16/11 Tr. at 163-167

benefit to fish if all other conditions effecting fish in the system remain unchanged," meaning that because of the habitat conditions and other stressors present, improving just the water quality without addressing the other stressors is not going to result in a significant improvement in the aquatic community.[430] Limnotech's Habitat Evaluation Study results showed that habitat is much more important to fish than temperature.[431] It was Mr. Bell's expert opinion that the fish community will not improve measurably if the proposed water quality standards, including the thermal standards, are adopted.[432]

In sum, the scientific and technical evidence regarding the physical and biological limitations of the UAA waters shows that even if the power plants' discharges were not there, an aquatic community that attains the CWA ALU goals still would not be present.[433]

VIII. The Conditions Satisfying the UAA Factors for the CAWS and UDIP are not Reversible and Remediation of Habitat Limitations is not Feasible

The possibility of remediation to address UAA factors preventing attainment of CWA goals must be considered when a proposed use designation falls below the CWA goals.[434] The primary and overriding limiting factor in the CAWS is the locks and dams because their presence and use to control flow levels have such a significant adverse impact on aquatic life. Hence, remediation would require removing or substantially modifying them, including changing how they operate.[435] In its Second Notice Order and Opinion in Subdocket A of this rule-making, the Board correctly found that the impoundments in the CSSC and the Brandon Road Pool in the

[430] Habitat Evaluation Report (PC 284) at p. 57; 5/16/11 Tr. at 167-168
[431] 5/16/11 Tr. At 186-187; Habitat Evaluation Report (PC 284) at p. 141
[432] 5/16/11 Tr. at 167 & 183
[433] 11/10/09 AM Tr. at 61-62
[434] Ex. 2 of Ex. 366 at 32
[435] Ex. 2 of Ex. 366 at 32

LDR are irreversible in the foreseeable future.[436] The presence of impoundments created by the lock and dam system, and associated heavy barge traffic, results in a whole series of cascading negative effects, including degraded habitat, turbidity, and the accumulation and re-suspension of silt and contaminated sediments.[437]

All but one mile of the 14 mile long Dresden Pool is impounded; thus all of the resulting negative effects of impoundment of this waterbody are visited upon habitat throughout the UDIP and adversely affect the fish community on a widespread basis.[438] Because the main purpose of the impoundments is to sustain the use of the waterway for commercial navigation, which is a protected use, their removal is not feasible and is not required by the CWA.[439] Also, the locks and dams are used to convey wastewater from Chicago and the surrounding communities downstream and to control the flow in the waterway to protect against flooding, for which there are no feasible alternatives.[440] The Illinois EPA agrees that the commercial use and flow control of the CAWS and UDIP, which depends upon the locks and dams, will continue and is not reversible.[441]

A related irreversible and limiting condition on the UDIP is the lack of fast water and riffles.[442] Many intolerant fish species need and inhabit riffle areas in a river.[443] Without riffle areas, those fish will not be part of the UDIP fish community regardless of its water quality.[444] However, creating adequate riffle area in the UDIP is not feasible because it requires a

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[436] Opinion and Order, Second Notice in Subdocket A, *In the Matter of Water Quality Standards and Effluent Limitations for the Chicago Area Waterway System and Lower Des Plaines River: Proposed Amendments to 35 Ill. Adm. Code 301, 302, 303, and 304*, R08-09, at 42
[437] 11/10/09 AM Tr. at 61, Ex. 369 at 14, and Ex. 2 of Ex. 366 at 8
[438] Ex. 2 of Ex. 366 at 10
[439] Ex. 2 of Ex. 366 at 32
[440] Ex. 2 of Ex. 366 at 32
[441] 1/29/08 Tr. at 41, 43
[442] 11/9/09 PM Tr. at 128
[443] 11/9/09 PM Tr. at 129
[444] 11/9/09 PM Tr. at 129

significant construction effort involving the creation of a gradient to increase the speed of the water flow and to allow the riffles to form.[445] Perhaps more importantly, the protected navigational use of the UDIP and the CAWS precludes establishment of riffles. Riffles are, by definition, shallow areas with fast water. Such riffle areas would prevent passage of not only commercial vessels but would also greatly limit transit of recreational craft, which is a use now protected under the Incidental Contact Recreational Use for the UDIP adopted by the Board in Subdocket A.[446]

Sediment, another major and persistent impediment to biological improvements in the CAWS and UDIP, is also both unpreventable and irreversible.[447] In this system, sedimentation does not result from a natural geomorphic process. It is from urban, construction and agricultural stormwater runoff, one of the most significant pollutants of all river systems.[448] The areas surrounding these UAA waters continue to grow in population. Particularly in the Will County area that surrounds the Brandon Road Pool and the UDIP, increased urbanization and continued agricultural use, combined with the lack of effective non-point source controls and continuing CSO contributions, means that non-point source related degradation, particularly sediment loading, will be the dominant source of impairment in these waters.[449] The sediment data presented in this proceeding bears this out. The data showed no change in the severity of sedimentation between 2003 and 2008 in the UDIP.[450] There is simply no basis for the LDR UAA Report's statement that the contaminated sediments in the UDIP can be removed permanently[451] and the Report contains no data or information to support that statement. It fails

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[445] 11/9/09 PM Tr. at 130
[446] Opinion and Order of the Board, R2008-09(A), dated August 18, 2011 at p. 1
[447] Ex. 366 at 5
[448] Ex. 369 at 5, 11/17/08 Tr. at 129
[449] Ex. 369 at 5, 11/9/09 PM Tr. at 92
[450] 11/9/09 PM Tr. at 104-105
[451] 1/13/10 AM Tr. at 71

to identify any proposal or plan, let alone the amount of funding that would be necessary and available, to remove the sediments, contaminated or otherwise. Moreover, even if one were to assume that the waterway sediments could be removed, its impounded and urbanized condition guarantees that additional, fine silty sediment will continue to be deposited and will prevent any sustained improvement in habitat. Illinois EPA agrees that "[t]he unpreventable and irreversible accumulation and physical quality of the sediments that will always be present in the system is limiting further biological improvements in the CSSC and UDIP, with existing, depositional area sediment contamination exacerbating the fundamental siltation problem."[452]

The contaminated nature of the sediments also cannot be reversed. Contamination in the sediments is so bad that to dredge would be a major undertaking and may actually cause more environmental damage. To improve aquatic life in the UDIP, it would be necessary to remove most of the contaminated sediment.[453] However, there are no known plans to remove contaminated sediments in the UDIP. There are some limited types of remediation that could be implemented, but the size of the area requiring the remediation and the measures required to achieve that remediation would require remediation on an unprecedented scale.[454] Any project to remove contaminated sediments from the waterway would be one of the largest in the United States, costing hundreds of millions of dollars, because of the spatial extent of the extreme contamination.[455] Illinois EPA has stated there are no plans to remediate the CAWS on such a scale.[456] However, even assuming all of the significantly contaminated and toxic sediments could be removed, it would still only provide temporary improvement.[457] Without removing the

[452] 2/1/08 Tr. at 41
[453] 11/10/11 Tr. at 61
[454] Ex. 2 of Ex. 366 at 33
[455] Ex. 369 at 7
[456] Ex. 2 of Ex. 366 at 33
[457] Ex. 369 at 7

sources that contribute these sediments, the problem would simply begin again. The hydrologic conditions and additional loadings would result in the re-accumulation of contaminated sediments because the sources of these sediments and the conditions that allow them to accumulate would continue to exist.[458]

IX. The Proposed UAA Thermal Standards Are Not Economically Reasonable

Once a state designates a use, the state is then required to adopt water quality criteria, expressed in terms of numerical values or narrative criteria, to protect its designated uses. The aquatic uses chosen for the South Branch of the Chicago River, the CSSC and UDIP will determine these water quality standards, including thermal standards, for these waterbodies as well as for the other parts of the CAWS. While the Illinois EPA's proposed thermal standards will be addressed in Subdocket D, their economic impacts are relevant here.

Under Section 27 of the Illinois Environmental Protection Act, when promulgating a rule, the Board must take into account several matters including the technical feasibility and economic reasonableness of reducing pollution.[459] As the Illinois EPA pointed out in its Statement of Reasons, the Board is required to examine the economic impacts of any new technology required by the rulemaking. The LDR UAA Report also noted that economic and operational considerations may be significant and should be given due consideration.[460]

To achieve and maintain compliance with the proposed UAA thermal standards, Midwest Generation would have to install closed-cycle cooling through the use of cooling towers at its stations.[461] The evidence shows that the costs of doing so are not economically reasonable, particularly given the absence of any significant environmental benefit. Prior to the Agency's

[458] Ex. 369 at 7 and Attachment 1 of Ex. 369 at 8
[459] 415 ILCS 5/27(a) (2010). The Board also makes a determination whether the proposed rule has any adverse economic impact on the people of Illinois. 415 ILCS 5/27(b) (2010)
[460] Attachment A, UAA Report at 2-104
[461] Ex. 440,Prefiled Testimony of Ray E. Henry with attachments (Ex. B to Ex. 440 is the Sargent & Lundy Report); see also 3/9/11 Tr. at 45 *et seq.*

filing of this rulemaking, in response to its request, Midwest Generation retained the services of Sargent & Lundy LCC, a recognized expert in the field, to provide an estimate to the Agency of thermal compliance costs.[462] At that time, because the Agency had not yet proposed either use designations or thermal standards, Midwest Generation advised Sargent & Lundy to use the stricter General Use thermal standards as a basis for its review.[463] Sargent & Lundy's review concluded that it would cost approximately $559 million to $790 million to install the cooling technology to control the temperature of the effluent from the five stations.[464]

As part of this rule-making, Midwest Generation requested that Sargent & Lundy update its review and base it on the proposed thermal standards filed by the Agency in this rulemaking (now docketed as R2008-09 (D)). Sargent & Lundy prepared an extensive report containing its updated evaluation of the cooling technologies capable of achieving the proposed thermal standards and Mr. Ray E. Henry, Principal Consultant of Sargent & Lundy, LLC, presented testimony on that evaluation.[465] Sargent & Lundy evaluated the feasibility of both open-cycle cooling and closed cycle cooling on all of the facilities as well as the addition of helper cooling towers. The closed-cycle cooling technologies considered were wet cooling towers, dry cooling towers and wet/dry cooling towers. As Mr. Henry testified, Sargent & Lundy concluded that helper cooling towers and open cycle cooling would not be able to achieve and maintain the proposed UAA thermal standards.[466] Retrofitting the stations to closed-cycle cooling, through

[462] Attachment SS to the Illinois EPA Statement of Reasons, MWGen Presentation to UAA Stakeholders Group, "Appropriate Thermal Water Quality Standards for the Chicago Sanitary and Ship Canal and Lower Des Plaines River," March 22, 2007
[463] Attachment SS to the Illinois EPA Statement of Reasons
[464] Illinois EPA Statement of Reasons at 99, Attachment SS to the Illinois EPA Statement of Reasons, slide 14
[465] Ex. 440, Prefiled testimony of Ray E. Henry
[466] Ex. 440 at 6

the use of cooling tower technology, was the only option that would effectively achieve and maintain compliance with the proposed UAA thermal standards. [467]

The estimated capital cost to install closed-cycle cooling towers in all five of the MWGen stations sufficient to comply with the proposed UAA thermal standards is nearly $1 billion.[468] Even assuming that the Fisk and Crawford Stations will be closed prior to the compliance deadline for any newly adopted thermal water quality standards, the estimated compliance costs for the remaining Midwest Generation stations are still economically unreasonable. The estimated capital costs range from $115 million for the Joliet 6 facility to $300 million for the Joliet 7&8 facility, for a combined total of over $415 million in capital costs just for the two Joliet Stations located in the UDIP, and an additional estimated capital cost of $257 million for the Will County Station.[469] The largest capital expense was the cooling towers themselves, and that was just the cost to obtain and install the towers, not to operate them.[470] The estimated annual operation and maintenance costs ("O&M costs") total over $17 million per year for these three facilities (approximately $2.7 million for Joliet 6, $9.1 million for Joliet 7&8 and $5.8 million for Will County). [471] Further, because the closed-cycle cooling would require additional power to pump the water, Midwest Generation would have to redirect power from its output to power the towers, resulting in an additional revenue loss beyond these capital and O&M cost totals.[472] These costs represent the low end of the range of closed-cycle cooling costs because they do not include all of the potential compliance costs. Additional potential costs that were not considered or included in Sargent & Lundy's cost estimates are noise abatement, other regulatory

[467] Ex. 440 at 8
[468] Ex. 440 at 14
[469] Ex. 440 at 14
[470] Ex. 440 at 14
[471] Ex. 440 at 15 and Table ES-2
[472] Ex. 440 at 15, 3/8/11 Tr. at 98

agency requirements, and multiple other unknown complications that could occur during the actual design and construction of the closed-cycle cooling systems.[473] None of these cost estimates were rebutted and hence, are undisputed in this rulemaking.

Particularly for the UDIP, where the Agency's presumption that this UAA segment is capable of attaining the CWA's ALU goal has been rebutted by the evidence showing that one or more of the UAA Factors have been satisfied, the costs of compliance that are associated with the Agency's proposed UDIP thermal standards are clearly not economically reasonable. There also is no evidence showing any improvement to the aquatic communities in the UDIP or the subject CAWS UAA segments that could possibly justify the extreme costs to achieve the proposed thermal standards. Clearly, the record shows that any minimal environmental benefit that may potentially be realized is greatly outweighed by the accompanying economically unreasonable compliance costs that would be incurred to achieve it. Consistent with both the CWA and the Illinois Environmental Protection Act, the Board should create use designations that reflect a realistic and accurate description of what these segments of the UAA waters can attain. If it does so, it will be a first and critical step to avoiding the unnecessary and unreasonable economic burdens described in the Sargent & Lundy Report.

X. Proposed Revisions to the Aquatic Life Use Designation Language for ALU B

As MWGen stated at the beginning of these comments, it does not disagree with the substance of the Illinois EPA's Aquatic Life Use ("ALU") B proposed use designations for the South Branch of the Chicago River, the CSSC and the Brandon Road Pool. However, MWGen suggests that the language of ALU B should be improved upon to better convey the limiting factors that are present in these waters and on which the ALU use designation is based.

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[473] Ex. 440 at 17

In evaluating the CSSC and the South Branch of the Chicago River, Illinois EPA agreed that the CSSC cannot attain the CWA's aquatic use goals and proposed a lower aquatic life use, "Aquatic Life Use B."[474] Illinois EPA also agreed that these waters have poor habitat; however it is unclear whether the language of the proposed "Aquatic Life Use B" use classification accurately classifies highly modified streams that are characterized by poor habitat, heavily industrialized use and very limited aquatic life potential.[475]

With regard to the Agency's proposed section 302.235 ALU B language, Midwest Generation suggests that the ALU B designation at the least should expressly include reference to the fact that these waters are capable of a limited use designation due to the highly modified and man-made features. While the proposed language refers generally to their "unique physical conditions," it does not reveal that those conditions are unique because of their highly modified and man-made nature of these waters. Similarly, while the ALU B language refers generally to "flow patterns," the reference is rather vague and its intended meaning should be clarified. MWGen suggests that it should also reflect the fact that the flow patterns are "managed and controlled by a lock and dam system" in lieu of the more vague reference to "flow patterns, and operational controls." Accordingly, Midwest Generation suggests that the language of section 302.235 should instead provide as follows:

> 302.235 Chicago Area Waterway System and Brandon Pool Aquatic Life Use B Waters
>
> Waters designated as Chicago Area Waterway System and Brandon Pool Aquatic Life Use B Waters are capable of maintaining limited warm-water aquatic-life populations predominated by individuals of tolerant types that are adaptive to the highly modified and man-made physical conditions, characterized by deep-draft, steep-walled shipping channels and by flow patterns which are controlled by a lock and dam system designed to maintain the navigational use, flood control and drainage functions of these waters.

[474] Ex. 366 at 14
[475] Ex. 366 at 15

XI. The Aquatic Life Use Designation for the UDIP Should Reflect its Modified and Impounded Condition and the Aquatic Community those Conditions can Support

MWGen submits that the proposed UDIP aquatic life use designation is wrong, not only because it is not scientifically supportable[476] but also because the record evidence shows that one or more of the UAA Factors has been satisfied for the UDIP. Thus, pursuant to the UAA regulations, the Board may not properly adopt the Agency's proposed UDIP ALU because it reflects a higher, unattainable use.

While Illinois EPA acknowledges that its proposed UDIP use designation is "unique," it simultaneously contends that the UDIP shares characteristics with General Use waters that allow it to attain CWA aquatic goals.[477] However, it cannot point to any other Illinois General Use waterbody that has the combination and extent of channelization, impoundment, siltation and sedimentation, commercial navigation, irregular flows, and significant inputs from urban stormwater and wastewater discharges that characterize the UDIP.[478] The above analysis and review of the record evidence on the UDIP shows that the extent of the impairments in the UDIP distinguishes it from any other General Use water and also prevents it from attaining the CWA aquatic life goals.[479]

There is a way to properly designate the use for the UDIP. A State may subcategorize the use designations, even creating seasonal uses, and set the criteria to reflect the varying needs of each subcategory.[480] As the principle purpose of designated uses is to broadcast the desired state of the surface waters to all interested parties, a designated use classification system should ideally be one that easily translates into indicators, such as numeric water quality criteria and

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[476] Ex. 366 at 14
[477] Ex. 366 at 14
[478] Ex. 366 at 14
[479] Ex. 2 of Ex. 366 at 33
[480] 40 CFR §131.10(c), (f)

biological indexes, which respond in predictable ways to stress allowing for effective evaluation of the data collected from the waterbody. For example, Ohio's use classification system describes the desired state of the surface waters and translates this into water quality criteria.[481]

Illinois has not yet proceeded far enough in updating its existing, generic use classification system to allow the use of indicators such as those incorporated into Ohio's use classification system. However, the basic subcategorization approach that Ohio has adopted is still a useful reference tool here. The Ohio EPA created a use classification system that has categories of streams, such as "Limited Warm Water" and "Modified Warm Water,"[482] and subclassifications within these categories, such as "Impounded", which reflect the key limiting characteristic of the waters placed in that subcategory.[483] This tiered approach to creating aquatic life uses allows for a more precise management of the waterbodies and is the approach recommended by US EPA. "[F]lexibility inherent in the state process for designating uses allows the development of subcategories of uses within the Act's general categories to refine and clarify specific use classes. Clarification of the use class is particularly helpful when a variety of surface waters with distinct characteristics fit within the same use class, or do not fit well into any category."[484] Even absent the completion of the work necessary to adopt a more advanced use classification system like Ohio's, this tiered approach will help advance Illinois towards the goal of having the use designation more clearly reflect the state of the waterbodies to which it applies.

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[481] See Chapter 3745-1-07 of the Ohio Administrative Code, available at: http://www.epa.ohio.gov/portals/35/rules/01-07.pdf (last checked 2/21/12)

[482] "The Modified Warmwater Habitat (MWH) applies to extensively modified habitats that are capable of supporting the semblance of a warmwater biological community, but fall short of attaining WWH because of functional and structural deficiencies due primarily to altered macrohabitat. The lowest degree of biological integrity, reflecting poor and very poor communities, is Limited Resource Water (LRW). Source; http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/biocriteria/aquaticlifeohio.cfm

[483] Ex. 366 at 15

[484] U.S. EPA *Water Quality Standards Handbook* (1994), Section 2.3, at 2-5

A tiered approach which takes into consideration the particular waterbody characteristics is a better method to ensure that the designated use is neither under protective of existing uses or overprotective for waters that are extensively and irretrievably altered. Such a tiered approach helps to clarify and refine water quality criteria to attain those goals.[485] Use classifications that identify the key stream characteristics that qualify a waterbody are a more scientifically credible approach to establishing a multi-tiered use classification under state water quality regulations.[486] As the U.S. EPA has stated:

> Subcategories of aquatic life uses may be on the basis of attainable habitat (e.g., coldwater versus warmwater habitat; innate differences in community structure and function (e.g., high versus low species richness or productivity); or fundamental differences in important community components (e.g., warmwater fish community dominated by bass versus catfish).[487]

With regards to the UDIP, the use designation created by the Illinois EPA does not accurately reflect conditions in the UDIP, particularly that the impairments in the UDIP prevent it from attaining the CWA goals. In 2004, Mr. Rankin recommended to Illinois EPA that the Ohio Modified Warm Water Habitat Use for impounded rivers (MWH-I) would be the most appropriate model to use for the UDIP.[488] Mr. Rankin noted that the Brandon Tailwater area was isolated, and that the UDIP was impounded and impacted by barge traffic.[489] He stated that "systematic alteration and urbanization also contributes to the physical limitations we observed."[490] The Ohio MWH-I use designation category applies to waterbodies that are not capable of attaining the CWA's aquatic life goals due to the limiting factors inherent to impounded

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[485] The U.S. EPA's 1998 Advanced Notice of Proposed Rulemaking addresses why there is value in more refined designated uses. Regarding general "aquatic life" uses, the U.S. EPA recommended they should be refined to more clearly articulate and differentiate intended levels of protection to avoid under or over protection in establishing criteria to fully protect the use. 63 Fed.Reg. 36742, 36749 (July 7, 1998)
[486] Ex. 366 at 15
[487] U.S. EPA Water Quality Standards Handbook (1994), Section 2.3 at 2-5
[488] Ex. 366 at 15
[489] Ex. 2 of Ex. 366 at 33
[490] Ex. 2 of Ex. 366 at 33

waters.[491] Also, it takes into account the presence of the limited area of better habitat in the Brandon Tailwater, while recognizing the many limitations also present in the UDIP (impounded, channelized, lack of sinuosity, excessive siltation, lack of riffles, lack of fast water, and lack of gradient.[492] Illinois EPA agreed with Mr. Rankin's conclusion, and surprisingly then proceeded to completely ignore his recommendations without any explanation.[493] As the developer of the QHEI system, Mr. Rankin's independent and unbiased opinion as to the appropriate use designation of the UDIP is relevant and worthy of greater consideration.[494]

Using the Ohio Use Classification System as a guide, Midwest Generation proposes that the UDIP use designation language of section 302.237 be revised to include language that describes its capability to support an aquatic community that primarily consists of lentic species of tolerant and intermediately tolerant types, which is what the record evidence shows. The use designation language also should include the key limiting conditions that characterize the UDIP, such as its urbanized and effluent-dominated conditions. Referencing these key conditions is consistent with U.S. EPA's *Draft Guidance on Implementing Water Quality-Based Provision on the CSO Control Policy*, EPA-823-13-00-003, May 9, 2000 (as updated EPA 833-D-00-002, December 20, 2000), which proposed "qualitative use subcategories could be established for urban areas based on biological goals that could reasonably be achieved in urban-impacted waters."

Because the impounded nature of a waterbody has such a significant effect on the aquatic life uses that it can attain, a use classification description that recognizes the "impounded" attribute of the UDIP will serve as an informative and helpful tool in crafting a scientifically

[491] Ex. 366 at 15, Ex. 2 of Ex. 366 at 33
[492] Ex. 2 of 366 at 33; 11/9/09 PM Tr. at 31, 87
[493] Ex. 366 at 15
[494] Ex. 2 of Ex. 366 at 33

sound use category that is also understandable by the public.[495] The UDIP should more accurately be classified and described as a "Modified-Impounded" use that is not capable of attaining the CWA aquatic life use goals. [496]

For all of the above reasons, Midwest Generation proposes the following UDIP use designation rule language for the Board's consideration:

302.237 Upper Dresden Island Pool Aquatic Life Use Waters

Lower Des Plaines River from the Brandon Road Lock and Dam to the Interstate 55 Bridge shall be designated for the Upper Dresden Island Pool Aquatic Life Use. These effluent-dominated, urban-impacted waters are capable of maintaining warm water aquatic-life populations consisting primarily of lentic species of tolerant and intermediately tolerant types that are adaptive to the impounded, channelized and artificially-controlled flow and widespread siltation conditions created by the operation of the locks and dams that are necessary to maintain the existing navigational use and upstream flood control functions of the waterway system.

XII. Conclusion

The record evidence in this extensive rulemaking meets the Clean Water Act's standards for rebutting the presumption that any of the subject UAA segments are capable of attaining its fishable goal. The evidence supports the following findings:

- The South Branch of the Chicago River, the CSSC and the Brandon Pool should be classified as "Aquatic Life Use B." The relevant facts and scientific data, including the comprehensive Habitat Evaluation and Improvements Reports submitted by the District, show that there is no rationale and scientific basis for classifying the South Branch as a higher ALU use designation than the CSSC. There is no evidence showing that the South Branch is capable of supporting a higher quality aquatic community than is the CSSC. In both the South Branch and the CSSC, the existing quality and potential of the aquatic community is severely limited based on conditions that satisfy UAA Factor 3: Sedimentation, Barge Traffic, Asian Carp controls, UAA Factor 4: Dams and other Hydrologic Modifications, and UAA Factor 5: the Physical Features in the water system.

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[495] Ex. 366 at 16

[496] Ex. 2 of Ex. 366 at 12 citing Attachment R to Illinois EPA Statement of Reasons, section entitled "Des Plaines River [Recommended Category; MWH-I, Other]"

- Although the biological and physical conditions of the UDIP are somewhat better than in the immediately upstream ALU B Brandon Pool, they are still sorely lacking. The record evidence, which includes both extensive scientific data and expert opinion testimony, regarding the biological and physical conditions in the UDIP shows that it too satisfies UAA Factors 3, 4 and 5 and therefore, the presumption that the UDIP is capable of attainable the CWA's fishable goal has been rebutted.

Both the CAWS segments and the UDIP have been altered and are managed to support their main purposes of commercial navigation and flood control, both of which are existing uses that the CWA requires be protected. These protected uses give rise to the main causes and contributors to the multiple impairments and constraints to aquatic life that prevent these waters from being capable of attaining the CWA's fishable goal.

In particular, under UAA Factor 4, the presence and operation of the locks and dams to support the commercial navigation and flood control uses results in impounded conditions that prevent the existence of complex or diverse habitats by eliminating riffles, reducing the amount of fast water, increasing sedimentation and disrupting normal sediment flow, interrupting or eliminating fish migration, and reducing the number and variety of aquatic insects. All of this creates a simplified habitat that causes a uniform fish community composed mainly of tolerant species in these waters. The negative consequences of the impoundments also cascades into the other two UAA Factors, 3 and 5.

The scrutiny brought to bear in this rulemaking on the Agency's determination that the UDIP is capable of "minimally attaining" the CWA aquatic life use goals has shown that it is not supported by the relevant scientific and technical evidence, much of which the Agency did not take into account in reaching its decision. In the course of this proceeding, the Illinois EPA also agreed that "[i]f you put impoundments into a system by – almost by definition, you're going to

reduce the biological integrity."[497] The evidence shows that Dresden Pool is 93% impounded. This highly impounded condition, together with the multiple number and close proximity of the dams on the waterway, result in significant constraints for aquatic life in the UDIP. There are no plans or intentions of removing any of the impoundments because of the necessary use of the waterway for commercial navigation, flood control and wastewater transport purposes. Even the very limited Brandon Tailwater area of the UDIP is not protected against the adverse effects of the managed, "bath tub"-like nature of the flow regime in the UDIP. The high flows can damage vulnerable egg and larval stage fish and rapid reductions in flow can strand small fish in the Tailwater area. The Illinois EPA has not presented any evidence to back up its assumption that fish can adapt to these adverse flow conditions.

UAA Factor 3, that human caused conditions or sources of pollution prevent the attainment of the CWA aquatic goals and cannot be remediated, is also fully applicable to the CAWS segments and the inability of the UDIP to "minimally" attain the CWA aquatic goals. Sedimentation exists throughout the CAWS and UDIP, in pools, side-channels and backwater areas, with a majority of the UDIP having moderate to severe conditions. The sedimentation is not decreasing, as shown by extensive sediment survey results in this record, and is significantly contaminated, at toxic levels, as shown by studies from the 1990's to the most recent in 2008. Sedimentation and resulting turbidity are major stressors because they impair spawning for higher quality fish species. Regardless of the reduction in sediment loads when TARP is finally completed, now proposed for 2029, the UDIP is outside the reach, and hence the direct benefits, of TARP. Moreover, even with the completion of TARP, the dominant flow in the system will still be wastewater, as well as the non-point source flows from urban and agricultural runoff in the UDIP, all of which continue to reload the system with pollutants and sediments. And on top

[497] 1/28/08 Tr. at 258; See also: 3/10/08 AM Tr. at 90; 1/28/08 Tr. at 258-60

of the barge traffic that injures, kill or strands fish and resuspends the toxic sediments in all of these waters, in the UDIP, the presence of, and governmental response activities to, the Asian Carp in the UDIP is the final human caused condition that stymies the UDIP's ability to minimally attain the CWA aquatic goals.

UAA Factor 5 is also satisfied for these waters because the physical conditions related to the natural features of the water body, such as lack of proper substrate, cover, flow, depth, pools, riffles and the like, unrelated to water quality, preclude attainment of aquatic life uses. None of these waters has enough good habitat to support a balanced, diverse fish community. The UDIP has constant commercial navigation, a great influx of wastewater, extensive urbanization, and channelization. The extensive EA Engineering QHEI survey work showed that almost all of the UDIP (over 90%) has none of the good habitat necessary for a healthy fish population. The one area of marginally good habitat, the Brandon Tailwater, is isolated from the rest of the UDIP and is exceptionally small.[498] There is not and never will be a balanced fish community in the UDIP. As shown by the extensive fish collections by EA Engineering, improved chemical conditions in the waterway have not improved the diversity of the fish community. Without a fundamental change in the habitat, such as by removing the dams, there simply will not be an improvement. But the dams are an integral part of the protected commercial navigation and flood control functions of the UDIP which the Clean Water Act requires be maintained.

It is indisputable that both the CAWS segments and the UDIP are part of a highly urbanized area that itself is a major stressor that impedes their ability to attain the CWA aquatic goals. Studies have shown that urbanization, to the extent present here, makes attainment unlikely. This too is an irreversible condition.

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[498] IEPA Statement of Reasons at p. 17

The record evidence also shows that it is not the thermal conditions in these waters that prevents them from attaining the CWA's fishable goal. The above-described stressors have been shown to be the dominant and major causes of the significant negative impacts on habitat and in turn on aquatic life. Even the Illinois EPA admitted that "[i]f you fix the temperature, the aquatic life use may not show a response, because there are other factors, then, that kick into place."[499] The facts are clear. Both the CAWS segments and the UDIP satisfy at least three of the six factors identified by the CWA as a basis on which the waterway cannot attain the CWA aquatic goals - - and it only takes satisfaction of one UAA Factor to make this case.

Midwest Generation supports the ALU B designation for the South Branch Chicago River, the CSSC and Brandon Pool. Because the evidence shows that the UDIP cannot "minimally attain" the CWA's fishable goal, Midwest Generation submits that its proposed UDIP ALU set forth in Exhibit A hereto should be adopted by the Board or its substantial equivalent. This proposed ALU accurately recites both the major limiting conditions in the UDIP and the resulting highest aquatic life use it is capable of maintaining, consistent with applicable law and regulations.

Particularly given the substantial interests which Midwest Generation has in the issues presented by this rulemaking, MWGen appreciates the extensive amount of time and effort the Board and the Hearing Officer have devoted to this complex and geographically broad-based proceeding. Midwest Generation recognizes that this has been a long road, albeit a necessary one, for the Board to travel and appreciates the opportunities that have been afforded for interested parties to present evidence and comment on the relevant issues.

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[499] 1/28/08 Tr. at 172

Respectfully submitted,

MIDWEST GENERATION, L.L.C.

By: /s/ Susan M. Franzetti
Susan M. Franzetti

Date: March 5, 2012

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EXHIBIT A

EXHIBIT A

PROPOSED AQUATIC LIFE USE DESIGNATION FOR THE UPPER DRESDEN ISLAND POOL

302.237 Upper Dresden Island Pool Aquatic Life Use Waters

Lower Des Plaines River from the Brandon Road Lock and Dam to the Interstate 55 Bridge shall be designated for the Upper Dresden Island Pool Aquatic Life Use. These effluent-dominated, urban-impacted waters are capable of maintaining warm water aquatic-life populations consisting primarily of lentic species of tolerant and intermediately tolerant types that are adaptive to the impounded, channelized and artificially-controlled flow and widespread siltation conditions created by the operation of the locks and dams that are necessary to maintain the existing navigational use and upstream flood control functions of the waterway system.

EXHIBIT B

Google Earth What's This? Google Map

Illinois River at Lockport Lock and Dam

Stream Name: Illinois River
Gage Zero: 0 Ft. NA
Flood Stage:541.00 Ft.
Record High Stage:546.59 Ft.

Longitude: -88.07722000
Latitude: 41.56860000
River Mile: 291.1 miles above the mouth of the Illinois River
Record High Stage Date: 12/04/1982

Drainage Area : 740.00 Mi^2

Location of Gage :

Lockport Lock and Dam is located at river mile 291.1, 1.1 river miles upstream of the EJ&E RR Bridge in Will County.

The Pool Elevation is referenced to International Great Lakes Datum (IGLD). To convert to NGVD 1929, add 1.3 feet.

The Tailwater Elevation is referenced to NGVD 1929 Datum.

This gage is operated by the USACE (Rock Island District).

Latest Data
02/22/2012 14:00 Central

Latest Stage	538.58 Ft.
24 Hr. Change	-0.59 Ft.
Last Year's Stage	539.46 Ft.
Today's Historic Normal Stage	538.90 Ft.
Today's Historic Max Stage	542.44 Ft.
Today's Historic Min Stage	538.12 Ft.
Latest Pool Level	576.11 Ft.
24 Hr. Change	+0.11 Ft.
Last Year's Pool Level	574.27 Ft.
Latest Computed Flow	M

7 Days Plot

Stage Tabulate

Daily Historic Data
(06:00 Central Reading)

Choose A Parameter

From JAN 1 2012
To DEC 31 2012

Stage

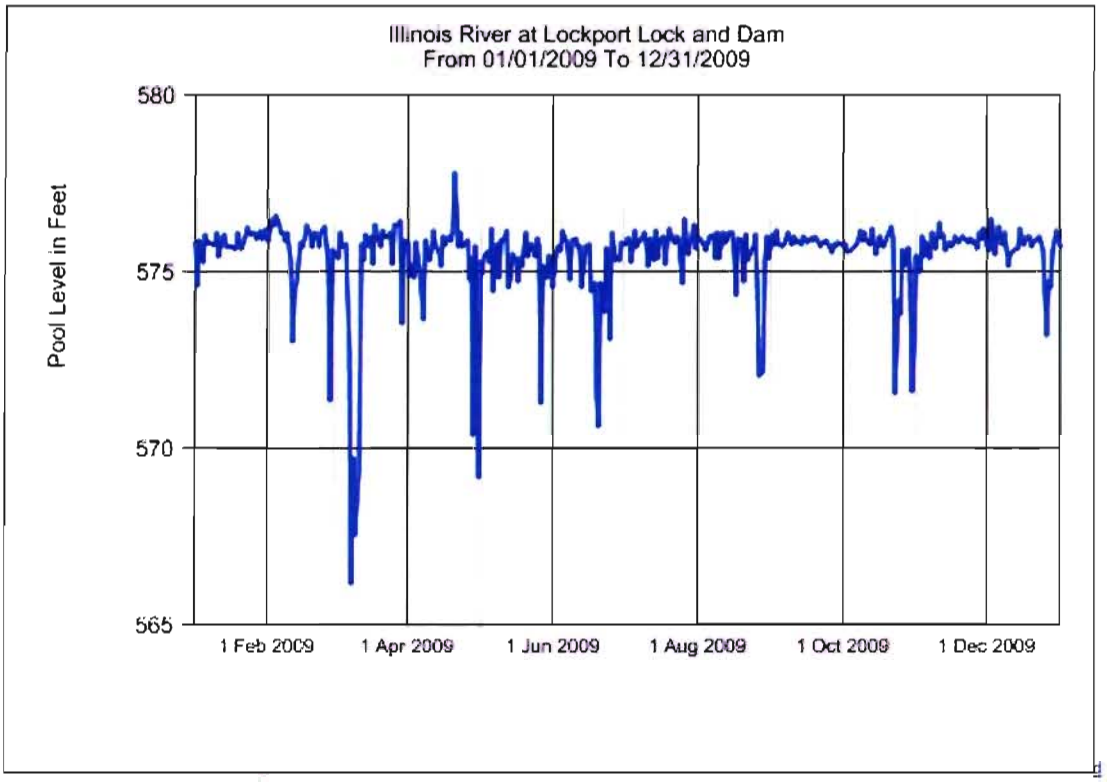
Plot Tabulate Tabulate (Yearly Formatted)

Additional Links:
View Record Elevation High / Lows
Historic Flood Profiles (Lockport Pool)

US Army Corps of Engineers - Rock Island District - Water Control Center - Contact Us

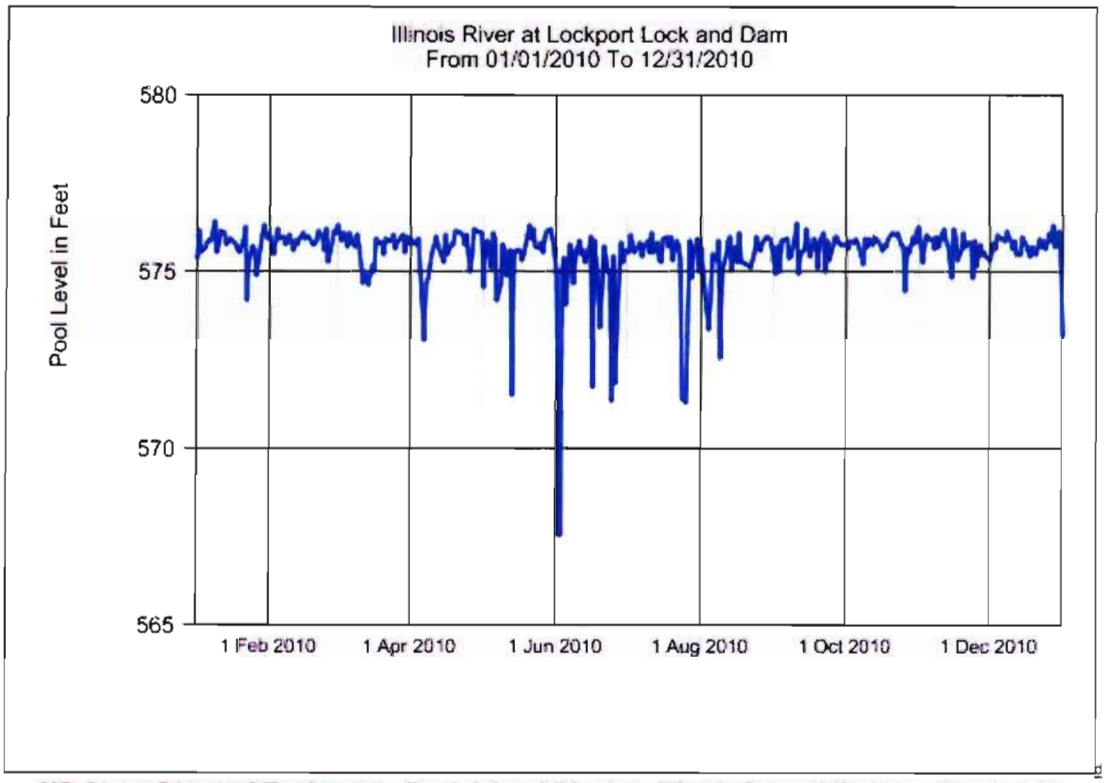
******PC# 1277******

Illinois River at Lockport Lock and Dam
(06:00 Central)



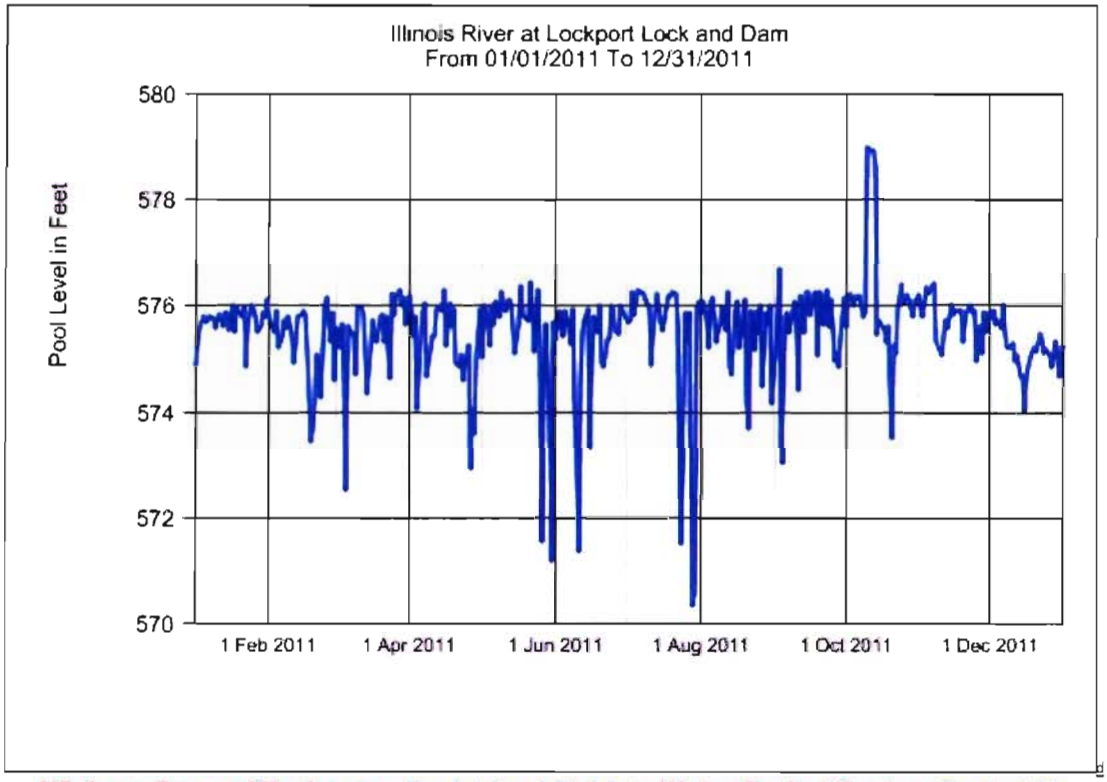
US Army Corps of Engineers - Rock Island District - Water Control Center - Contact Us

Illinois River at Lockport Lock and Dam
(06:00 Central)



US Army Corps of Engineers - Rock Island District - Water Control Center - Contact Us

Illinois River at Lockport Lock and Dam
(06:00 Central)



US Army Corps of Engineers - Rock Island District - Water Control Center - Contact Us

RIVERGAGES.COM

Water Levels of Rivers and Lakes

US Army Corps of Engineers

Google Earth What's This? Google Map

Des Plaines River at Ruby Street Bridge at Joliet, IL

Gage Zero: 0 Ft. 0

Longitude: -88.08250000
Latitude: 41.53638889
River Mile: 288.6

Drainage Area : 1503.00 Mi^2
Location of Gage :

Located in Will County, Joliet, IL. on the right bank, downstream side of the Ruby Street bridge, 2.7 miles upstream of Brandon Road Lock and Dam

For official flow data, please visit the USGS website listed in the Additional Links for this station.

This gage is cooperatively operated by the US Army Corps of Engineers (Rock Island District) and the US Geological Survey (Illinois District).

Latest Data
02/22/2012 15:00 Central

Latest Stage	538.83 Ft.
24 Hr. Change	-0.22 Ft.
Latest Flow	2,381 CFS
Latest Water Temp	52 °F

7 Days

Plot

Stage

Tabulate

Daily Historic Data
(06:00 Central Reading)

Choose A Parameter

From JAN 1 2011
To DEC 31 2011

Stage

Plot

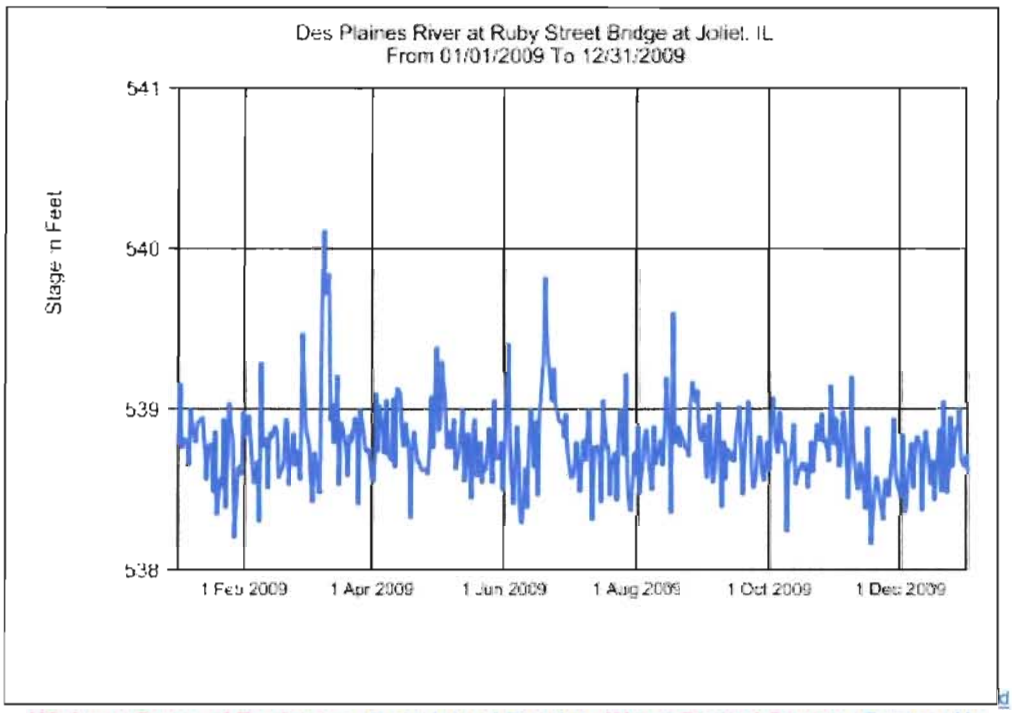
Tabulate

Tabulate (Yearly Formatted)

Additional Links:
Official USGS data for this station

US Army Corps of Engineers - Rock Island District - Water Control Center - Contact Us

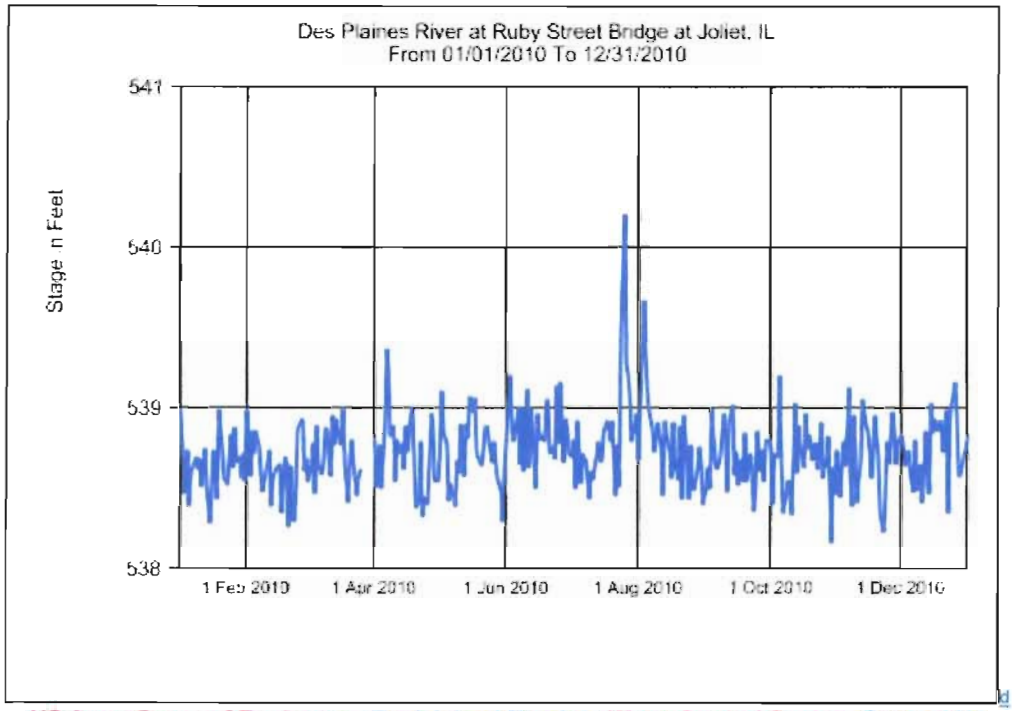
Des Plaines River at Ruby Street Bridge at Joliet, IL
(06:00 Central)



View Graph

US Army Corps of Engineers - Rock Island District - Water Control Center - Contact Us

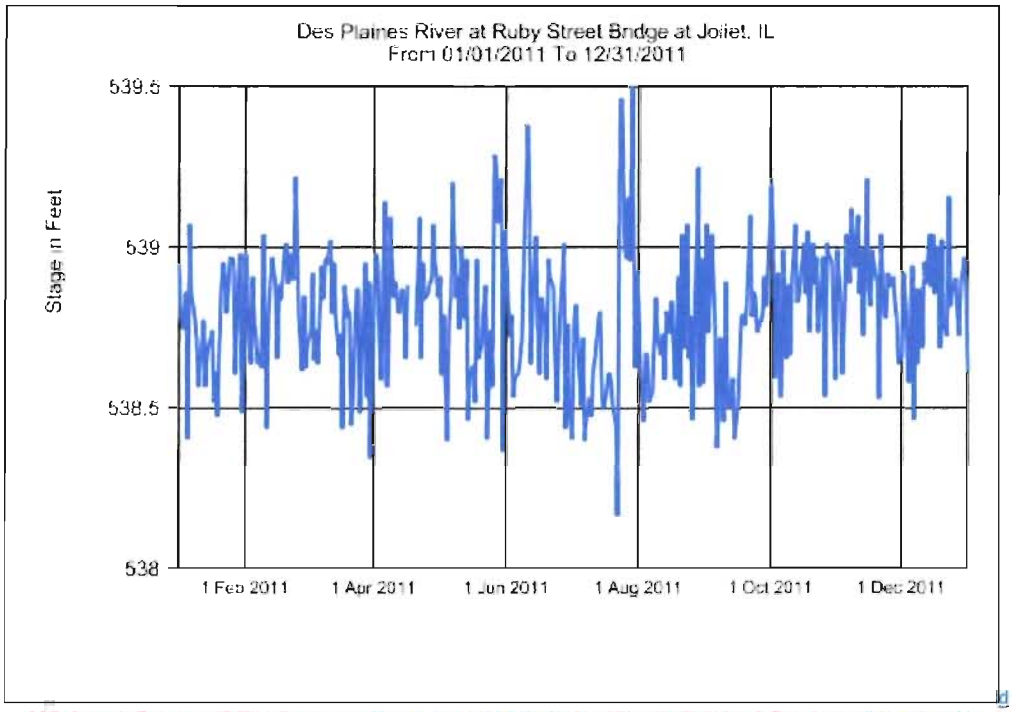
Des Plaines River at Ruby Street Bridge at Joliet, IL
(06:00 Central)



View Graph

US Army Corps of Engineers - Rock Island District - Water Control Center - Contact Us

Des Plaines River at Ruby Street Bridge at Joliet, IL
(06:00 Central)



View Graph

US Army Corps of Engineers - Rock Island District - Water Control Center - Contact Us

RIVERGAGES.COM

Water Levels of Rivers and Lakes

US Army Corps of Engineers

Google Earth What's This? Google Map

Illinois River at Brandon Road Lock and Dam

Stream Name: Illinois River
Gage Zero: 0 Ft. NGVD29
Flood Stage:507.00 Ft.
Record High Stage:513.30 Ft.

Longitude: -88.10833000
Latitude: 41.50417000
River Mile: 285.9 miles above the mouth of the Illinois River
Record High Stage Date: 07/13/1957

Drainage Area : 1506.00 Mi^2

Location of Gage : Brandon Road Lock and Dam is located at river mile 285.9, .8 miles downstream of I-80 Hwy Bridge in Will County.

This gage is operated by the US Army Corps of Engineers (Rock Island District).

Latest Data
02/22/2012 14:00 Central

Latest Stage	505.10 Ft.
24 Hr. Change	-0.07 Ft.
Last Year's Stage	506.12 Ft.
Today's Historic Normal Stage	505.00 Ft.
Today's Historic Max Stage	511.01 Ft.
Today's Historic Min Stage	504.20 Ft.
Latest Pool Level	538.78 Ft.
24 Hr. Change	-0.04 Ft.
Last Year's Pool Level	538.75 Ft.
Latest Flow	2,280 CFS
Latest Computed Flow	M

7 Days Stage

Plot Tabulate

Daily Historic Data
(06:00 Central Reading)

Choose A Parameter

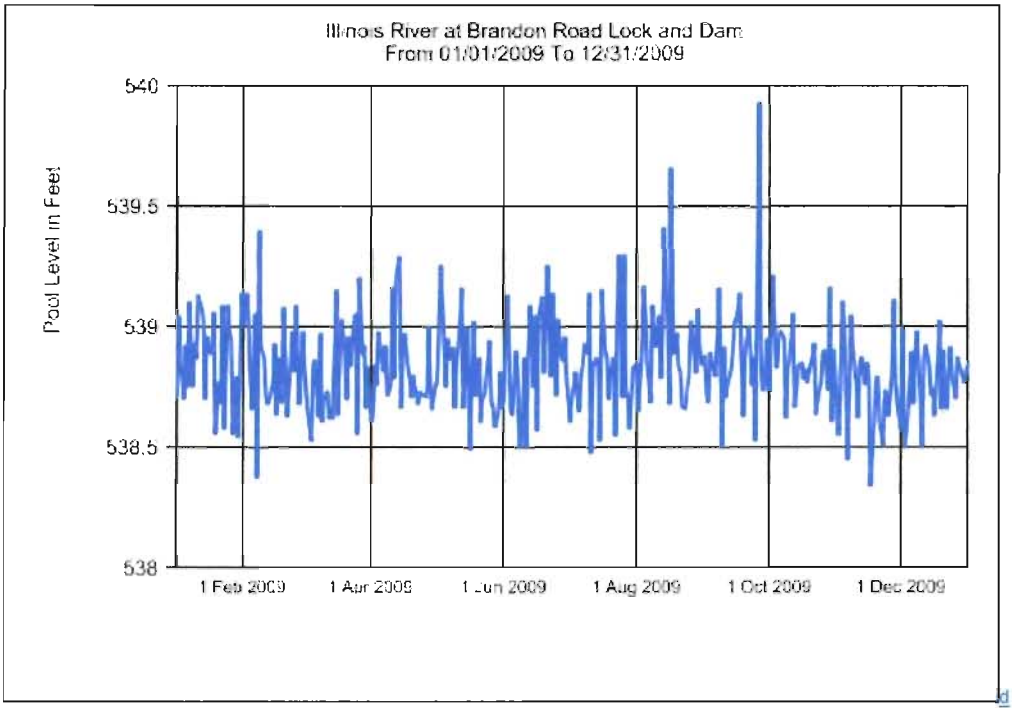
From JAN 1 2009
To DEC 31 2009

Stage

Plot Tabulate Tabulate (Yearly Formatted)

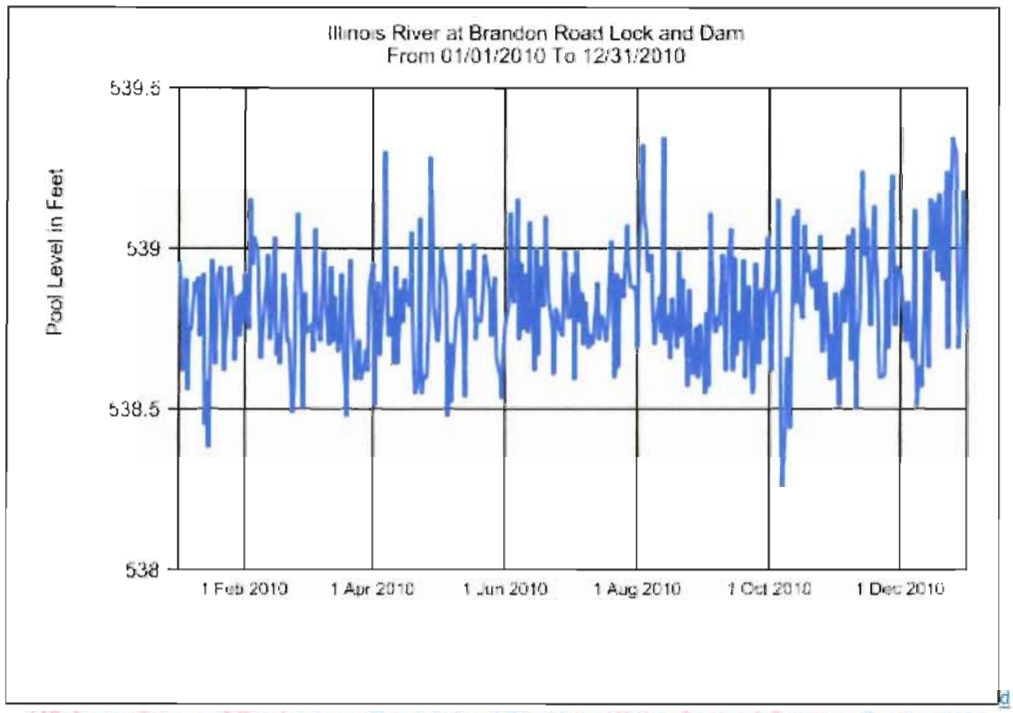
Additional Links:
View Record Elevation High / Lows
Flow Calculator for Brandon Road L&D
Historic Flood Profiles (Brandon Road Pool)
Flow/Stage Flood Frequency
WebMET- Brandon Road

Illinois River at Brandon Road Lock and Dam
(06:00 Central)



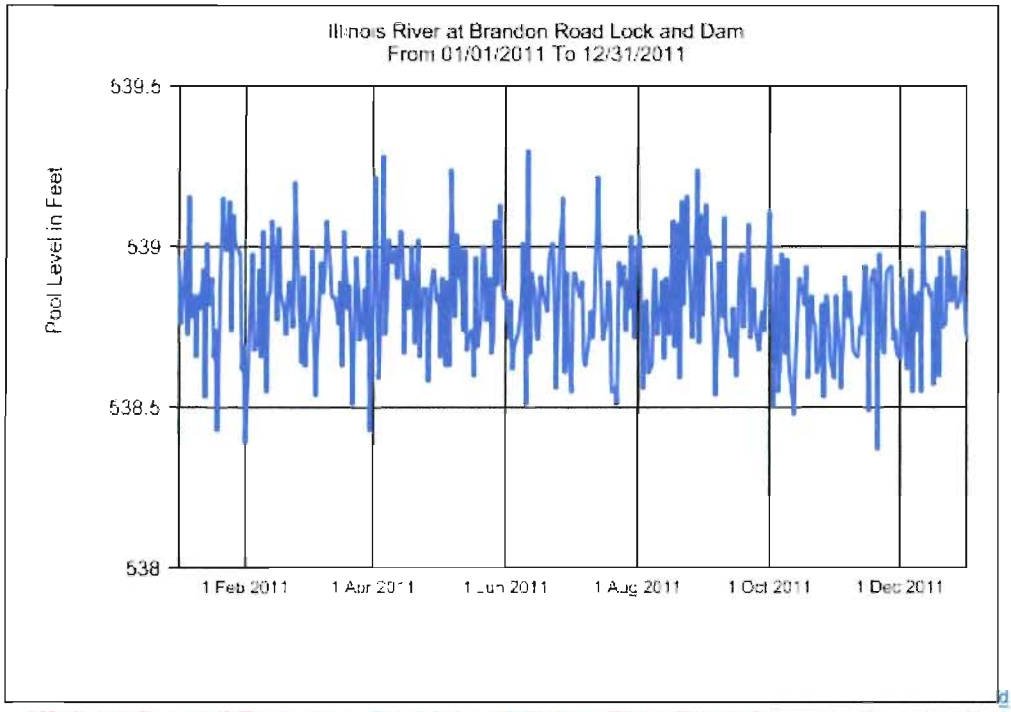
US Army Corps of Engineers - Rock Island District - Water Control Center - Contact Us

Illinois River at Brandon Road Lock and Dam
(06:00 Central)



US Army Corps of Engineers - Rock Island District - Water Control Center - Contact Us

Illinois River at Brandon Road Lock and Dam
(06:00 Central)



US Army Corps of Engineers - Rock Island District - Water Control Center - Contact Us

EXHIBIT C

667 F.3d 765, 73 ERC 1353
(Cite as: 667 F.3d 765)

United States Court of Appeals,
Seventh Circuit.
State of MICHIGAN, et al., Plaintiffs–Appellants,
and
Grand Traverse Band of Ottawa and Chippewa Indians, Intervenor–Appellant,
v.
UNITED STATES ARMY CORPS OF ENGINEERS, et al., Defendants–Appellees,
and
City of Chicago, et al., Intervenors–Appellees.

No. **10–3891**.
Argued May 5, **2011**.
Decided Aug. 24, **2011**.[FN*]
Opinion Published Sept. 13, **2011**.

Background: States bordering the Great Lakes filed lawsuit against Army Corps of Engineers and municipal water reclamation district, which together owned and operated the Chicago Area Waterway System (CAWS), seeking preliminary injunction that would require the defendants to put in place additional physical barriers throughout the CAWS, implement new procedures to stop invasive non-native species of carp, and expedite a study of how best to separate the Mississippi and Great Lakes watersheds permanently. The United States District Court for the Northern District of Illinois, Robert M. Dow, Jr., J., 2010 WL 5018559, denied motion for a preliminary injunction, and the states appealed.

Holding: The Court of Appeals, Wood, Circuit Judge, held that although states established a good or even substantial likelihood of success on merits, balance of harms favored defendants.

Affirmed.

West Headnotes

[1] Nuisance 279 62

279 Nuisance
279II Public Nuisances
279II(A) Nature of Injury, and Liability Therefor
279k62 k. Public annoyance, injury, or danger. Most Cited Cases

A "public nuisance" is a substantial and unreasonable interference with a right common to the general public, usually affecting the public health, safety, peace, comfort, or convenience. Restatement (Second) Torts § 821B.

[2] Nuisance 279 61

279 Nuisance
279II Public Nuisances
279II(A) Nature of Injury, and Liability Therefor
279k61 k. Matters constituting public nuisances in general. Most Cited Cases

Federal common law of public nuisance extends to the environmental and economic destruction caused by the introduction of an invasive, non-native organism into a new ecosystem.

[3] United States 393 125(17)

393 United States
393IX Actions
393k125 Liability and Consent of United States to Be Sued
393k125(17) k. Declaratory judgment. Most Cited Cases

United States 393 125(18)

393 United States
393IX Actions
393k125 Liability and Consent of United States to Be Sued
393k125(18) k. Injunction. Most Cited Cases

Waiver of sovereign immunity contained in Administrative Procedure Act (APA) subjected Army Corps of Engineers (Corps) to the states' common-law claims for declaratory and injunctive relief to stop a non-native species of carp invading Lake Michigan in

numbers great enough to constitute a public nuisance. 5 U.S.C.A. § 702.

[4] United States 393 ⚿125(3)

393 United States
393IX Actions
393k125 Liability and Consent of United States to Be Sued
393k125(3) k. Necessity of waiver or consent. Most Cited Cases

Absent a waiver, sovereign immunity shields the federal government and its agencies from suit.

[5] United States 393 ⚿125(5)

393 United States
393IX Actions
393k125 Liability and Consent of United States to Be Sued
393k125(5) k. Mode and sufficiency of waiver or consent. Most Cited Cases

Waiver of sovereign immunity under Administrative Procedure Act (APA) applies when any federal statute authorizes review of agency action, as well as in cases involving constitutional challenges and other claims arising under federal law. 5 U.S.C.A. § 702.

[6] Federal Courts 170B ⚿374

170B Federal Courts
170BVI State Laws as Rules of Decision
170BVI(A) In General
170Bk374 k. Matters of general jurisprudence; federal common law. Most Cited Cases

Federal common law is subject to the paramount authority of Congress.

[7] Nuisance 279 ⚿59

279 Nuisance
279II Public Nuisances
279II(A) Nature of Injury, and Liability Therefor
279k59 k. Nature and elements of public nuisance in general. Most Cited Cases

Congressional efforts to curb the migration of invasive species, and of invasive carp in particular, had not reached a sufficient level as to displace federal common law so as to preclude suit for declaratory and injunctive relief to stop a non-native species of carp invading Lake Michigan in numbers great enough to constitute a public nuisance.

[8] Nuisance 279 ⚿77

279 Nuisance
279II Public Nuisances
279II(C) Abatement and Injunction
279k77 k. Nature of remedy. Most Cited Cases

A court may grant equitable relief to abate a public nuisance that is occurring or to stop a threatened nuisance from arising.

[9] Nuisance 279 ⚿61

279 Nuisance
279II Public Nuisances
279II(A) Nature of Injury, and Liability Therefor
279k61 k. Matters constituting public nuisances in general. Most Cited Cases

Nuisance 279 ⚿79

279 Nuisance
279II Public Nuisances
279II(C) Abatement and Injunction
279k79 k. Grounds for proceedings for abatement. Most Cited Cases

Job of a court considering the merits of a public nuisance claim is simply to determine whether the activity complained of is a nuisance and, if so, whether it is sufficiently close to occurring that equitable relief is necessary to prevent it from happening.

[10] Injunction 212 ⚿138.18

212 Injunction
212IV Preliminary and Interlocutory Injunctions
212IV(A) Grounds and Proceedings to Procure

667 F.3d 765, 73 ERC 1353
(Cite as: 667 F.3d 765)

212IV(A)2 Grounds and Objections
212k138.18 k. Likelihood of success on merits. Most Cited Cases

Injunction 212 158

212 Injunction
212IV Preliminary and Interlocutory Injunctions
212IV(A) Grounds and Proceedings to Procure
212IV(A)4 Proceedings
212k156 Order on Application
212k158 k. Operation and effect. Most Cited Cases

Findings made at the preliminary injunction stage do not bind the district court as the case progresses; most significant difference between the preliminary injunction phase and the merits phase is that a plaintiff in the former position needs only to show a likelihood of success on the merits rather than actual success. Fed.Rules Civ.Proc.Rule 65, 28 U.S.C.A.

[11] Injunction 212 138.46

212 Injunction
212IV Preliminary and Interlocutory Injunctions
212IV(A) Grounds and Proceedings to Procure
212IV(A)3 Subjects of Relief
212k138.45 Public Officers, Boards and Municipalities; Schools and Colleges
212k138.46 k. In general. Most Cited Cases

States bordering the Great Lakes, which sought preliminary injunction that would require Army Corps of Engineers and municipal water reclamation district to implement new procedures to stop non-native species of carp from invading Lake Michigan, established a good or even substantial likelihood of success on merits of their claim that the carp would invade Lake Michigan in numbers great enough to constitute a public nuisance. Fed.Rules Civ.Proc.Rule 65, 28 U.S.C.A.

[12] Environmental Law 149E 661

149E Environmental Law
149EXIII Judicial Review or Intervention
149Ek661 k. Finality. Most Cited Cases

Army Corps of Engineers' (Corps) operation of Chicago Area Waterway System (CAWS) in a manner that allegedly would let invasive carp into Lake Michigan, reliance on allegedly ineffective electric barriers, use of locks in areas where living and dead carp have been found, and denial of the states' requests for additional relief were not "final" agency actions within meaning of Administrative Procedure Act (APA); the "actions" were not discrete at all, and those that might be so classified did not represent the final outcome of any decisionmaking process by the Corps. 5 U.S.C.A. § 704.

[13] Administrative Law and Procedure 15A 704

15A Administrative Law and Procedure
15AV Judicial Review of Administrative Decisions
15AV(B) Decisions and Acts Reviewable
15Ak704 k. Finality; ripeness. Most Cited Cases

Agency action is "final" within meaning of Administrative Procedure Act (APA) when it marks the consummation of the agency's decisionmaking process and determines legal rights or obligations. 5 U.S.C.A. § 704.

[14] Injunction 212 138.46

212 Injunction
212IV Preliminary and Interlocutory Injunctions
212IV(A) Grounds and Proceedings to Procure
212IV(A)3 Subjects of Relief
212k138.45 Public Officers, Boards and Municipalities; Schools and Colleges
212k138.46 k. In general. Most Cited Cases

States bordering the Great Lakes showed, to the degree necessary for preliminary relief, that irreparable harm would come to pass absent injunctive relief requiring Army Corps of Engineers and municipal water reclamation district, to take actions stopping invasive non-native species of carp from invading Lake Michigan in numbers great enough to constitute a public nuisance. Fed.Rules Civ.Proc.Rule 65, 28 U.S.C.A.

667 F.3d 765, 73 ERC 1353
(Cite as: 667 F.3d 765)

[15] Injunction 212 ⚿138.6

212 Injunction
212IV Preliminary and Interlocutory Injunctions
212IV(A) Grounds and Proceedings to Procure
212IV(A)2 Grounds and Objections
212k138.6 k. Nature and extent of injury; irreparable injury. Most Cited Cases

For preliminary relief to be granted, the irreparable harm must be likely; there must be more than a mere possibility that the harm will come to pass, but the alleged harm need not be occurring or be certain to occur before a court may grant relief.

[16] Injunction 212 ⚿138.46

212 Injunction
212IV Preliminary and Interlocutory Injunctions
212IV(A) Grounds and Proceedings to Procure
212IV(A)3 Subjects of Relief
212k138.45 Public Officers, Boards and Municipalities; Schools and Colleges
212k138.46 k. In general. Most Cited Cases

Although states bordering the Great Lakes established a good or even substantial likelihood of success on merits of their claim that non-native species of carp would invade Lake Michigan in numbers great enough to constitute a public nuisance, and that they could cause irreparable harm, balance of harms favored Army Corps of Engineers and municipal water reclamation district, which together owned and operated the Chicago Area Waterway System (CAWS), and the public interests they represented to such an extent that preliminary injunction was not warranted; preliminary injunction requiring various elaborate measures would impose substantial costs and could impede other measures taken by agencies, yet would not assure much of a reduction in the risk of the invasive carp establishing themselves in Lake Michigan while suit was being adjudicated. Fed.Rules Civ.Proc.Rule 65, 28 U.S.C.A.

Robert P. Reichel (argued), Attorney, Office of the Attorney General of the **State** of **Michigan**, Environment, Natural Resources and Agriculture Division, Lansing, MI, J.B. Van Hollen, Attorney, Office of the Attorney General, Wisconsin Department of Justice, Madison, WI, Lori Swanson, Office of the Attorney General, St. Paul, MN, Richard Cordray, Attorney, Office of the Attorney General, Columbus, OH, Thomas W. Corbett, Jr., Attorney, Office of the Attorney General, Harrisburg, PA, for Plaintiffs–Appellants.

Michael T. Gray, Attorney, Department of Justice, Environment & Natural Resources Division, William M. Jay, Attorney, Department of Justice, Office of the Solicitor General, Washington, DC, Brendon O'Connor (argued), Ronald M. Hill, Attorney, Metropolitan Water Reclamation District of Greater Chicago, Chicago, IL, for Defendants–Appellees.

William C. Rastetter, Attorney, Olson, Bzdok & Howard, P.C., Traverse City, MI, for Plaintiff–Intervenor.

David L. Rieser (argued), Attorney, McGuirewoods LLP, Chicago, IL, Mara S. Georges, Myriam Z. Kasper, Attorneys, Office of the Corporation Counsel, Appeals Division, Stuart P. Krauskopf, Attorney, Law Offices of Stuart P. Krauskopf, Chicago, IL, for Intervenors–Appellees.

Before MANION, WOOD, and WILLIAMS, Circuit Judges.

WOOD, Circuit Judge.

Ambitious engineering projects that began at the time that the City of Chicago was founded have established a waterway in northeastern Illinois that connects Lake Michigan to the Mississippi watershed. (Additional links between the Mississippi and the Great Lakes exist elsewhere, from northern Minnesota to New York.) The system of canals, channels, locks, and dams, with which we are concerned, known today as the Chicago Area Waterway System (or CAWS, as the parties call it in their briefs), winds from the mouth of the Chicago River and four other points on Lake Michigan to tributaries of the Mississippi River in Illinois. The navigable link has been a boon to industry and commerce, and it supports transportation and recreation. Public health crises that once were common because the Chicago River emptied the City's sewage into the lake—the City's freshwater supply—vanished thanks to the Chicago Sanitary and Ship Canal, which reversed the flow of the Chicago River so that it now pulls water from the lake, into the CAWS, and down toward the Mississippi. During

heavy rains and seasonal high waters in the region, the CAWS is used to control flooding.

This effort to connect the Great Lakes and Mississippi watersheds has not been without controversy. At the turn of the 20th century, Missouri sued in the Supreme Court to stop Illinois from opening the Sanitary and Ship Canal. An opinion by Justice Holmes rejected Missouri's challenge; the Court concluded that the state had not presented enough evidence to establish that the flow of sewage toward the Mississippi would create a public nuisance. *Missouri v. Illinois,* 200 U.S. 496, 26 S.Ct. 268, 50 L.Ed. 572 (1906); see also *Missouri v. Illinois,* 180 U.S. 208, 21 S.Ct. 331, 45 L.Ed. 497 (1901). Several years later a broader fight erupted among the states bordering the Great Lakes, and the Court began to issue decrees setting the maximum rate at which Illinois may divert water away from Lake Michigan and into the CAWS. *E.g., Wisconsin v. Illinois,* 449 U.S. 48, 101 S.Ct. 557, 66 L.Ed.2d 253 (1980); *Wisconsin v. Illinois,* 388 U.S. 426, 87 S.Ct. 1774, 18 L.Ed.2d 1290 (1967); *Wisconsin v. Illinois,* 311 U.S. 107, 61 S.Ct. 154, 85 L.Ed. 73 (1940); *Wisconsin v. Illinois,* 278 U.S. 367, 49 S.Ct. 163, 73 L.Ed. 426 (1929). Nor has opening a pathway between these bodies of fresh water come without costs. This appeal requires us to consider one of those costs: the environmental and economic harm posed by two invasive species of carp, commonly known as **Asian carp**, which have migrated up the Mississippi River and now are poised at the brink of this man-made path to the Great Lakes. The carp are voracious eaters that consume small organisms on which the entire food chain relies; they crowd out native species as they enter new environments; they reproduce at a high rate; they travel quickly and adapt readily; and they have a dangerous habit of jumping out of the water and harming people and property.

In an attempt to stop the fish, Michigan, Minnesota, Ohio, Pennsylvania, and Wisconsin, all states bordering the Great Lakes, filed this lawsuit against the U.S. Army Corps of Engineers (the Corps) and the Metropolitan Water Reclamation District of Greater Chicago (the District), which together own and operate the facilities that make up the CAWS. The plaintiff states allege that the Corps and the District are managing the CAWS in a manner that will allow invasive carp to move for the first time into the Great Lakes. The states fear that if the fish establish a sustainable population there, ecological disaster and the collapse of billion-dollar industries that depend on the existing ecosystem will follow. They say that the defendants' failure to close down parts of the CAWS to avert the crisis creates a grave risk of harm, in violation of the federal common law of public nuisance, see *American Electric Power Co., Inc. v. Connecticut,* —— U.S. ——, 131 S.Ct. 2527, 180 L.Ed.2d 435 (**2011**), and they advance a related claim against the Corps based on the Administrative Procedure Act (APA), 5 U.S.C. § 702. The states asked the district court for declaratory and injunctive relief and moved for a preliminary injunction that would require the defendants to put in place additional physical barriers throughout the CAWS, implement new procedures to stop invasive carp, and expedite a study of how best to separate the Mississippi and Great Lakes watersheds permanently. Other parties intervened to protect their interests—the Grand Traverse Band of Ottawa and Chippewa Indians on the side of the plaintiffs, and the City of Chicago, Wendella Sightseeing Company, and the Coalition to Save Our Waterways as defendants. The district court denied the motion for a preliminary injunction, and the states appealed immediately. See 28 U.S.C. § 1292(a)(1).

We conclude that the court's decision to deny preliminary relief was not an abuse of discretion. Our analysis, however, differs in significant respects from that of the district court, which was persuaded that the plaintiffs had shown only a minimal chance of succeeding on their claims. We are less sanguine about the prospects of keeping the carp at bay. In our view, the plaintiffs presented enough evidence at this preliminary stage of the case to establish a good or perhaps even a substantial likelihood of harm—that is, a non-trivial chance that the carp will invade Lake Michigan in numbers great enough to constitute a public nuisance. If the invasion comes to pass, there is little doubt that the harm to the plaintiff states would be irreparable. That does not mean, however, that they are automatically entitled to injunctive relief. The defendants, in collaboration with a great number of agencies and experts from the state and federal governments, have mounted a full-scale effort to stop the carp from reaching the Great Lakes, and this group has promised that additional steps will be taken in the near future. This effort diminishes any role that equitable relief would otherwise play. Although this case does not involve the same kind of formal legal regime that caused the Supreme Court to find displacement of the courts' common-law powers in *American Electric Power,* on the present state of the record we have

something close to it. In light of the active regulatory efforts that are ongoing, we conclude that an interim injunction would only get in the way. We stress, however, that if the agencies slip into somnolence or if the record reveals new information at the permanent injunction stage, this conclusion can be revisited.

I

To justify a preliminary injunction, the plaintiff states must show that they are likely to succeed on the merits of their claims, that they are likely to suffer irreparable harm without an injunction, that the harm they would suffer without the injunction is greater than the harm that preliminary relief would inflict on the defendants, and that the injunction is in the public interest. *Winter v. Natural Res. Def. Council, Inc.*, 555 U.S. 7, 20, 129 S.Ct. 365, 172 L.Ed.2d 249 (2008). We will affirm the decision to deny a preliminary injunction unless the district court has abused its discretion. *Judge v. Quinn*, 612 F.3d 537, 557 (7th Cir.2010). As usual, we review questions of fact for clear error and questions of law *de novo*. *Girl Scouts of Manitou Council, Inc. v. Girl Scouts of United States of Am., Inc.*, 549 F.3d 1079, 1086–87 (7th Cir.2008).

II

We begin with the states' likelihood of succeeding on their common law public nuisance claim. The district court thought that the states had "at best, a very modest likelihood of success." For the reasons discussed below, we think that the district court underestimated the likely merit of the states' claim, particularly at this early stage of the case.

A

The Supreme Court recently reminded us that when it said, "There is no federal general common law," in *Erie Railroad Co. v. Tompkins*, 304 U.S. 64, 78, 58 S.Ct. 817, 82 L.Ed. 1188 (1938), it did not close the door on federal common law entirely. *American Electric Power*, 131 S.Ct. at 2535–37. Instead, following *Erie*, a "keener understanding" of federal common law developed, under which federal courts "fill in 'statutory interstices,' and, if necessary, even 'fashion federal law' " in areas " 'within national legislative power.' " *Id.* at 2535 (quoting Henry J. Friendly, *In Praise of Erie—And of the New Federal Common Law*, 39 N.Y.U. L.Rev. 383 (1964)). In *American Electric Power*, the Court reaffirmed a long line of cases that have "approved federal common law suits brought by one State to abate pollution emanating from another State." 131 S.Ct. at 2535–36. These decisions reach at least as far back as the battle between Missouri and Illinois over sewage, see *Missouri v. Illinois, supra*, and they have continued from there, see *Georgia v. Tennessee Copper Co.*, 206 U.S. 230, 27 S.Ct. 618, 51 L.Ed. 1038 (1907), *New York v. New Jersey*, 256 U.S. 296, 41 S.Ct. 492, 65 L.Ed. 937 (1921), *New Jersey v. City of New York*, 283 U.S. 473, 51 S.Ct. 519, 75 L.Ed. 1176 (1931), *Illinois v. City of Milwaukee*, 406 U.S. 91, 92 S.Ct. 1385, 31 L.Ed.2d 712 (1972) (*Milwaukee I*), *City of Milwaukee v. Illinois*, 451 U.S. 304, 101 S.Ct. 1784, 68 L.Ed.2d 114 (1981) (*Milwaukee II*), and *American Electric Power*, 131 S.Ct. 2527. But it has been recognized for a much longer period that the equitable power of the courts extends to suits to abate public nuisances. See *United Steelworkers of America v. United States*, 361 U.S. 39, 60–61, 80 S.Ct. 1, 4 L.Ed.2d 12 (1959) (Frankfurter, J., concurring) (assembling examples from 16th century England to the turn of the 20th century in the United States).

It is our federal system that creates the need for a federal common law to govern interstate disputes over nuisances. *Tennessee Copper* explains that when the states joined the union and in so doing abandoned their right to abate foreign nuisances by force, "they did not thereby agree to submit to whatever might be done. They did not renounce the possibility of making reasonable demands on the ground of their still remaining quasi-sovereign interests; and the alternative to force is a suit in this court." 206 U.S. at 237, 27 S.Ct. 618. A state that wants to bring a lawsuit attacking a nuisance emanating from outside of its borders faces at least two legal difficulties: whom to sue, and what law to apply? If the offender is another state, then the Constitution permits an original action in the Supreme Court. U.S. CONST. art. III sec. 2, cl. 5. Whatever the venue, applicable law is a problem: the offending state owes no allegiance to the law of the plaintiff state, but the plaintiff state may rightly fear protectionism if the law of the offending state is used. *Committee for Consideration of the Jones Falls Sewage Sys. v. Train*, 539 F.2d 1006, 1008 (4th Cir.1976) (*en banc*). Responding to this concern, the Court has concluded that in the context of interstate nuisances "where there is an overriding federal interest in the need for a uniform rule of decision or where the controversy touches basic interests of federalism," federal common law governs. *Milwaukee I*, 406 U.S. at 105 n. 6, 92 S.Ct. 1385. When evaluating claims based on the federal common law of nuisance, courts must be mindful that

they do not have "creative power akin to that vested in Congress." *American Electric Power,* 131 S.Ct. at 2536.

1

The states' public nuisance action here is based on allegations that non-native species of carp (specifically, bighead and silver carp) will migrate through waterworks operated by the defendants from rivers connected to the Mississippi into Lake Michigan and on to the other Great Lakes. "When we deal with air and water in their ambient and interstate aspects, there is a federal common law." *Milwaukee I,* 406 U.S. at 103, 92 S.Ct. 1385. We know that this body of law applies in a dispute about "the pollution of a body of water such as Lake Michigan bounded, as it is, by four States," *id.* at 105 n. 6, 92 S.Ct. 1385. But the Court has cautioned that it has never "held that a State may sue to abate any and all manner of pollution originating outside its borders." *American Electric Power,* 131 S.Ct. at 2536. The Corps and the District contend that the common law does not extend to the allegations in this case. They stress that they are not emitting "traditional pollutants"; all they have done, they say, is to operate facilities in the CAWS through which invasive species already living in local rivers might travel on their own. We can dismiss the latter part of this argument without much discussion: the defendants bear responsibility for nuisances caused by their operation of a manmade waterway between the Great Lakes and Mississippi watersheds. That they are not themselves physically moving fish from one body of water to the other does not mean that their normal operation of the CAWS cannot cause a nuisance. See, *e.g.,* RESTATEMENT (SECOND) TORTS § 834 ("One is subject to liability for a nuisance caused by an activity, not only when he carries on the activity but also when he participates to a substantial extent in carrying it on.") & cmt. (b) (defining "activity" to include acts "that create physical conditions that are harmful to neighboring land after the activity that created them has ceased").

[1][2] Similarly, we know of no rule saying that the defendants must emit a "traditional pollutant" in order for federal common law to apply. While it may be true that the introduction of an invasive species of fish into a new ecosystem does not fit the concept of nuisance as neatly as a spill of toxic chemicals into a stream, we do not think the Supreme Court has limited the concept of public nuisance as much as the defendants suggest. A public nuisance is defined as a substantial and unreasonable interference with a right common to the general public, usually affecting the public health, safety, peace, comfort, or convenience. RESTATEMENT (SECOND) TORTS § 821B; DAN B. DOBBS, THE LAW OF TORTS § 467, at 1334 (2000). It would be arbitrary to conclude that this type of action extends to the harm caused by industrial pollution but not to the environmental and economic destruction caused by the introduction of an invasive, non-native organism into a new ecosystem (assuming that the states have correctly forecast the depletion of the Great Lakes fishery and the corresponding damage to the multi-billion-dollar sports fishing industry). Public nuisance traditionally has been understood to cover a tremendous range of subjects:

> It includes interferences with the public health, as in the case of a hogpen, the keeping of diseased animals, or a malarial pond; with the public safety, as in the case of the storage of explosives, the shooting of fireworks in the streets, harboring a vicious dog, or the practice of medicine by one not qualified; with public morals, as in the case of houses of prostitution, illegal liquor establishments, gambling houses, indecent exhibitions, bullfights, unlicensed prize fights, or public profanity; with the public peace, as by loud and disturbing noises, or an opera performance which threatens to cause a riot; with the public comfort, as in the case of bad odors, smoke, dust and vibration; with public convenience, as by obstructing a highway or a navigable stream, or creating a condition which makes travel unsafe or highly disagreeable, or the collection of an inconvenient crowd; and in addition, such unclassified offenses as eavesdropping on a jury, or being a common scold.

KEETON, *et al.,* PROSSER AND KEETON ON TORTS § 90, at 643–45 (5th ed.1984) (citations omitted). The Supreme Court's application of public nuisance principles to cases involving shared water resources reflects this broad understanding. For example, the Court has held that a change in one state's water-drainage system that causes flooding on another state's farms may create a public nuisance, see *North Dakota v. Minnesota,* 263 U.S. 365, 374, 44 S.Ct. 138, 68 L.Ed. 342 (1923); just as the industrial contamination of a body of water might, *Arizona Copper Co. v. Gillespie,* 230 U.S. 46, 57, 33 S.Ct. 1004, 57 L.Ed. 1384 (1913). In this vein, *American Electric Power*

emphasized "that public nuisance law, like common law generally, adapts to changing scientific and factual circumstances." 131 S.Ct. at 2536. The types of invasive carp that are the concern in this case have been designated as injurious species by the U.S. Fish and Wildlife Service, see 50 C.F.R. § 16.13(a)(2)(v); this designation means that it is a federal crime under the Lacy Act to transport them around or into the United States, 16 U.S.C. §§ 3371–78. We conclude that the federal common law of public nuisance extends to the problem that the plaintiff states have identified.

The next question, which is raised only by the Corps, is whether the plaintiff states may state a claim based on the federal common law of public nuisance against the United States. The Corps asserts that "the States have shown no basis for recognizing a federal common-law public nuisance claim against a federal agency." But the Corps has not developed the argument much beyond this broad statement. Its brief moves instead to a discussion of whether federal common law has been displaced by congressional legislation and whether there is any role for the courts to play when agencies have taken concerted action to address a problem. These are two important issues that we will explore below, but neither point explains why a claim based on the federal common law of public nuisance cannot move forward against the United States. The plaintiff states have done little to counter the Corps's suggestion. They reply (unresponsively, in our view) that "the federal common law of public nuisance undoubtedly exists."

The implications of finding that the United States has created a public nuisance strike us as potentially important and complex; this is not a topic that can be thrown on the table and then ignored. In this connection, it is telling that the Supreme Court went out of its way in *American Electric Power* to point out that it "ha[d] not yet decided whether private citizens ... or political subdivisions ... of a State may invoke the federal common law of nuisance to abate out-of-state pollution." 131 S.Ct. at 2536. It declined to answer that question because it thought it best to resolve the case on other grounds. But the Court's statement cautions us to tread carefully whenever we consider how far to push a theory of federal common law. This concern is less pressing for claims the Court has already recognized, such as those against state or local governmental entities or private parties. See, *e.g.*, *Missouri v. Illinois,* 200 U.S. 496, 26 S.Ct. 268 (states), *Milwaukee I,* 406 U.S. 91, 92 S.Ct. 1385 (political subdivisions); *Tennessee Copper,* 206 U.S. 230, 27 S.Ct. 618 (private citizens).

We have not discovered any case in which the Supreme Court has expressly authorized a public nuisance action against the United States in its sovereign capacity. A recent concurring opinion in the D.C. Circuit makes the same observation, noting that "the Court has not endorsed any federal common-law causes of action against the Government during the post-*Erie* period." *El–Shifa Pharm. Indus. Co. v. United States,* 607 F.3d 836, 853 (D.C.Cir.2010) (Kavanaugh, J., concurring). To understand common-law public nuisance in a way that would exclude suits against the United States would be faithful to the ancient origins of nuisance, where the term described the criminal act of infringing on the rights of the Crown, see William L. Prosser, *Private Action for Public Nuisance,* 52 Va. L.Rev. 997, 998 (1966); at least during that era, no one would have contemplated that the King or Queen could be the source of a nuisance. Whether this sort of sovereign prerogative has any place in modern American law, as a concept distinct from the sovereign immunity of the United States, is a separate question. Perhaps there is also a modern justification for the position that the federal common law of public nuisance cannot operate against the government: this area of federal common law exists to provide a uniform rule for interstate disputes that will serve the national interest, and it may be thought illogical to say that a federal actor, which in theory embodies the national interest, is at the same time violating a judge-made concept of that same interest.

On the other hand, there are respectable arguments in favor of applying public nuisance to the acts of federal agencies, depending on the activity in which the agency is engaged. We have moved far beyond the Divine Right of Kings and the concept that the Crown can do no wrong. We may assume that an agency's effort to regulate private actors in a particular area would not give rise to a claim of public nuisance. But it is hard to see why the United States's ownership of a dam, power plant, or other facility should automatically foreclose a public nuisance claim brought by a state for harms created by the operation of that facility. If the facility were located in and owned by State A and it was damaging State B, then State B would be

entitled to assert a common-law claim against State A (or one of its subdivisions or private citizens). Our case offers a good illustration of the point: the Corps and the District together operate facilities that are allegedly on the verge of creating a nuisance in waters of the plaintiff states; why should the plaintiffs be able to state a claim against the District but not the Corps?

The possible inconsistencies that would be created by such a rule may be the reason that no court has expressed concern about the appearance of the Tennessee Valley Authority—a federally owned entity that was created by Congress and acts like a private corporation—as a defendant in a public nuisance lawsuit. See *American Electric Power,* 131 S.Ct. 2527; *North Carolina ex rel. Cooper v. TVA,* 615 F.3d 291 (4th Cir.2010); *North Carolina ex rel. Cooper v. TVA,* 515 F.3d 344 (4th Cir.2008). In fact, out of all public nuisance decisions we have identified from either the Supreme Court or the Courts of Appeals that involve a federal agency as a defendant, none contains a whisper of discussion about whether the claim runs against the United States. In addition to the cases just mentioned, *see Middlesex Cnty. Sewerage Auth. v. National Sea Clammers Ass'n,* 453 U.S. 1, 4 & n. 3, 101 S.Ct. 2615, 69 L.Ed.2d 435 (1981) (claims against the Environmental Protection Agency (EPA) and the Corps); *Committee for Consideration of Jones Falls Sewage Sys.,* 539 F.2d 1006 (claims against the EPA); *Massachusetts v. U.S. Veterans Admin.,* 541 F.2d 119 (1st Cir.1976) (claims against the Veterans Administration). Whether the plaintiffs' common-law action can proceed against the Corps is a question that may well require attention as this case proceeds. Given the parties' cursory exposition of the issue and our ultimate conclusion that preliminary relief is not warranted, we find it unnecessary to say more at this point. (We see this as a question relating to the plaintiffs' ability to state a claim; it does not implicate the court's jurisdiction, and so there is nothing to prevent our declining to reach it.) For now, we will assume that the states' federal common-law claim may proceed against all of the defendants.

B

[3] The defendants argue that two additional obstacles also diminish the states' likelihood of succeeding on their public nuisance claim. The first concerns the sovereign immunity of the United States. The Corps contends that even if it makes sense to apply public nuisance principles against the United States, the Corps is nevertheless not subject to suit because the United States has not waived its sovereign immunity for this kind of claim. The second argument, which we address below, is that congressional regulation of the invasive carp problem has displaced any role for federal common law.

[4] "Absent a waiver, sovereign immunity shields the Federal Government and its agencies from suit." *F.D.I.C. v. Meyer,* 510 U.S. 471, 475, 114 S.Ct. 996, 127 L.Ed.2d 308 (1994). The Corps takes the position that there is no such waiver of immunity for lawsuits against the United States that seek declaratory and injunctive relief based on a federal common-law tort. Whether this is correct depends on the interaction between section 702 of the APA and the Federal Tort Claims Act (FTCA), 28 U.S.C. § 1346(b).

[5] We begin with a look at the APA. Section 702 reads as follows:

> A person suffering legal wrong because of agency action, or adversely affected or aggrieved by agency action within the meaning of a relevant statute, is entitled to judicial review thereof. An action in a court of the United States seeking relief other than money damages and stating a claim that an agency or an officer or employee thereof acted or failed to act in an official capacity or under color of legal authority shall not be dismissed nor relief therein be denied on the ground that it is against the United States or that the United States is an indispensable party.

5 U.S.C. § 702. "The first and second sentences of § 702 play quite different roles." *Veterans for Common Sense v. Shinseki,* 644 F.3d 845, 866 (9th Cir. **2011**). The first supplies a right to seek review of agency action; the second, added by the 1976 amendments to the statute, provides a waiver of sovereign immunity. *Id.* The waiver covers actions that seek specific relief other than money damages; this aptly describes the plaintiffs' claim for declaratory and injunctive relief. See *Blagojevich v. Gates,* 519 F.3d 370, 371–72 (7th Cir.2008) (noting that § 702 "waived sovereign immunity for most forms of prospective relief"); see also *Bowen v. Massachusetts,* 487 U.S. 879, 893, 108 S.Ct. 2722, 101 L.Ed.2d 749 (1988) (construing § 702's waiver broadly and remarking that "complaints [for] declaratory and injunctive relief ... [are] certainly not actions for money damages");

Veterans for Common Sense, 644 F.3d at 864–65. Moreover, the waiver in § 702 is not limited to claims brought pursuant to the review provisions contained in the APA itself. The waiver applies when any federal statute authorizes review of agency action, as well as in cases involving constitutional challenges and other claims arising under federal law. *Blagojevich,* 519 F.3d at 372; *Czerkies v. U.S. Dep't of Labor,* 73 F.3d 1435, 1437–38 (7th Cir.1996) (*en banc*); see also *Veterans for Common Sense,* 644 F.3d at 867–68; *Trudeau v. Federal Trade Comm'n,* 456 F.3d 178, 186–87 (D.C.Cir.2006); *United States v. City of Detroit,* 329 F.3d 515, 520–21 (6th Cir.2003) (*en banc*); *Jaffee v. United States,* 592 F.2d 712, 718 (3d Cir.1979).

Although the United States has argued from time to time that the "final agency action" requirement of § 704 limits the waiver of immunity in § 702, it has not prevailed on that ground. *E.g., Veterans for Common Sense,* 644 F.3d at 866–68; *Trudeau,* 456 F.3d at 186–87. The Corps wisely does not take that position here; as the Ninth Circuit explained recently, the conditions of § 704 affect the right of action contained in the first sentence of § 702, but they do not limit the waiver of immunity in § 702's second sentence. *Veterans for Common Sense,* 644 F.3d at 866–68. The only limitation on § 702 that requires our attention is the clause that says, "Nothing herein ... confers authority to grant relief if any other statute that grants consent to suit expressly or impliedly forbids the relief which is sought," 5 U.S.C. § 702(2), which Congress added to the statute at the same time that it introduced the waiver of sovereign immunity, see Pub.L. 94–574, 90 Stat. 2721 (Oct. 21, 1976). Pointing to this provision, the Corps frames an argument by negative implication: it says that when Congress enacted the FTCA in 1946, it did so against a backdrop of no tort liability for the United States; the FTCA waives the government's sovereign immunity in suits for money damages to the extent that a private person would be held liable under applicable state tort law, see 28 U.S.C. § 1346(b)(1); *Smith v. United States,* 507 U.S. 197, 201–02, 113 S.Ct. 1178, 122 L.Ed.2d 548 (1993); *Parrott v. United States,* 536 F.3d 629, 635 (7th Cir.2008); but while the FTCA authorizes actions for damages, it says nothing at all about injunctive relief; thus, the FTCA implicitly prohibits injunctive relief in tort suits against the United States; and because of § 702(2), the Corps's argument concludes, the plaintiffs cannot use the APA's waiver of immunity to assert a common-law tort claim against the United States.

That argument reads too much into congressional silence. The FTCA authorizes various tort claims for damages against the government to the extent that state law would provide relief, and it spells out a number of explicit exceptions. *E.g.,* 28 U.S.C. § 2674 (barring punitive damages and interest before judgment); *id.* § 2680 (limiting the waiver, among other circumstances, where the alleged tort concerns the government's enforcement of a statute or a discretionary function). There is nothing in the statute suggesting that Congress meant to forbid all actions that were not expressly authorized. To the contrary, section 702(2) requires evidence, in the form of either express language or fair implication, that Congress meant to forbid the relief that is sought. The Corps's effort to transform silence into implicit prohibition would seriously undermine Congress's effort in the APA to authorize specific relief against the United States. When Congress amended the APA in 1976 it gave every indication that it intended to provide specific relief for all nonstatutory claims against the government. See *Trudeau,* 456 F.3d at 186–87 (noting that all the reports from Congress "identified as the measure's clear purpose elimination of the sovereign immunity defense in *all* equitable actions" and that "the Senate Report plainly indicated that Congress expected the waiver to apply to nonstatutory actions") (internal quotation marks and alterations removed); *Jaffee,* 592 F.2d at 718–19 (outlining the reasons for the amendments to § 702, the concern that some executive departments were hiding behind their immunity, and concluding, "It was therefore precisely for equitable actions under section 1331 that Congress enacted the amendments to section 702").

The D.C. Circuit has read the Tucker Act, which it interprets as the exclusive remedy for contract claims against the government, to include an implicit prohibition against specific relief in contract actions against the United States and thus to prevent reliance on the APA's waiver of immunity in such cases. *Sharp v. Weinberger,* 798 F.2d 1521, 1523–24 (D.C.Cir.1986) (Scalia, J.). But the same court has since decided that, whatever the unspoken effect of the Tucker Act may be, the FTCA does not contain a comparable implicit ban against specific relief in tort cases against the government, and thus that plaintiffs in such cases may take advantage of the waiver in § 702 of the APA. *U.S. Info. Agency v. Krc,* 989 F.2d 1211, 1216 (D.C.Cir.1993). To the same effect, we

recently explained that while "[t]he tort claims act doesn't authorize equitable relief.... [T]he Administrative Procedure Act does," and we went on to say that a plaintiff asserting a tort claim against a federal agency could take advantage of the APA to obtain equitable relief. *Robinson v. Sherrod,* 631 F.3d 839, 841 (7th Cir. **2011**).

If that were not reason enough to reject the Corps's immunity defense, there is more. By its terms, the FTCA does not apply to *any* federal common-law tort claim, no matter what relief is sought. As the Corps itself points out, state tort law—not federal law—is the source of substantive liability under the FTCA. See *Meyer,* 510 U.S. at 478–79, 114 S.Ct. 996; *Sobitan v. Glud,* 589 F.3d 379, 388–89 (7th Cir.2009); *cf. Smith,* 507 U.S. at 198, 113 S.Ct. 1178 (no FTCA claim for tort committed in Antarctica, a sovereignless entity not subject to either state law or the law of a foreign country). The states' tort claim is based entirely on federal common law, and so the claim would not be cognizable under the FTCA in the first place. *Meyer,* 510 U.S. at 478, 114 S.Ct. 996. And if the FTCA could never apply to the type of claim advanced, then there is no reason to think that it implicitly forbids a particular type of relief for a claim outside its scope. For all these reasons, we conclude that the waiver contained in § 702 of the APA subjects the Corps to the plaintiffs' common-law claims for declaratory and injunctive relief.

C

The Corps and the District next contend that congressional regulation has displaced as a matter of law the federal common law on which the states rely. The district court rejected this argument on the ground that Congress had not done enough about the threat of invasive carp to qualify for displacement of the federal common-law claim. The defendants say this was error. As they see things, it is enough that Congress has passed legislation to stop the carp and that federal and state agencies are hard at work to address the problem. Because the parties disagree about the effect of *American Electric Power* and the way in which the displacement analysis should proceed, we begin with a few important principles.

[6] The doctrine of displacement rests on the premise that federal common law is subject to the paramount authority of Congress. *New Jersey v. New York,* 283 U.S. 336, 348, 51 S.Ct. 478, 75 L.Ed. 1104 (1931); see also *American Electric Power,* 131 S.Ct. at 2537 ("[I]t is primarily the office of Congress, not the federal courts, to prescribe national policy in areas of special federal interest."). " '[W]hen Congress addresses a question previously governed by a decision rested on federal common law ... the need for such an unusual exercise of law-making by federal courts disappears.' " *American Electric Power,* 131 S.Ct. at 2537 (quoting *Milwaukee II,* 451 U.S. at 314, 101 S.Ct. 1784). Displacement focuses on the relation between Congress and the federal courts—it is not a doctrine that is concerned with the relation between the federal courts and the executive branch. This is a distinction often neglected by courts, as well as by the parties to this case. Whether federal courts can or should play a role in the face of comprehensive agency action is a critical issue, which we address below, but executive action or lack thereof does not affect the displacement analysis. See *American Electric Power,* 131 S.Ct. at 2538–39 (rejecting the argument that an agency must have taken action before common law is displaced and explaining that the EPA's outright refusal to regulate emissions would not create a role for federal common law because "the delegation [of regulatory authority from Congress to the agency] is what displaces federal law"); *Milwaukee II,* 451 U.S. at 317–18, 324 n. 18, 101 S.Ct. 1784 (concluding that displacement had occurred because "*Congress* ... has occupied the field through the establishment of a comprehensive regulatory program supervised by an expert administrative agency," regardless of how thoroughly the agency has implemented that program) (emphasis added). Congress's decision to assign a particular problem to an executive agency or its description of an agency's role in addressing a problem may be evidence of displacement, but the ebb and flow of agency action neither diminishes nor increases the role of federal common law. The important displacement question is whether Congress has provided a sufficient legislative solution to the particular interstate nuisance here to warrant a conclusion that this legislation has occupied the field to the exclusion of federal common law.

[7] We readily concede that Congress has not been mute on the subject of the carp, but that simply underscores the critical question: how much congressional action is enough? In their supplemental memoranda filed after *American Electric Power* was decided, the defendants seize upon the statement from the opinion that we quoted above—that "the delegation is what displaces federal law." 131 S.Ct. at 2538.

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Their view is that all Congress must do to displace federal law is to indicate its intention to delegate a particular problem to an executive agency. They read *American Electric Power* as an enlargement of whatever displacement doctrine existed previously. But the defendants have taken the Court's statement out of context. The Court in that passage was responding to an argument that an agency must have acted pursuant to its statutory power before federal common law is displaced. See *id.* at 2538–39. The Court explained that this was not the case and that it is congressional action, not executive action, that guides the displacement analysis. In so ruling the Court did not establish a new test based solely on Congress's delegation of regulatory power; it simply pointed out that delegation is one type of congressional action that is evidence of displacement. "The test for whether congressional legislation excludes the declaration of federal common law," the Court said, "is simply whether the statute 'speak[s] directly to [the] question' at issue." *Id.* at 2537 (quoting *Mobil Oil Corp. v. Higginbotham,* 436 U.S. 618, 625, 98 S.Ct. 2010, 56 L.Ed.2d 581 (1978), and citing *Milwaukee II,* 451 U.S. at 315, 101 S.Ct. 1784, and *County of Oneida v. Oneida Indian Nation of N.Y.,* 470 U.S. 226, 236–37, 105 S.Ct. 1245, 84 L.Ed.2d 169 (1985)). Importantly, while Congress must have spoken to the particular question at issue, it is not necessary for us to find the same manifest congressional purpose that we would require in an analysis of whether Congress has preempted state law. *Id.* at 2537.

Earlier federal nuisance cases provide additional insight into the level of congressional action that is sufficient to displace federal common law. In *Milwaukee I,* where Illinois sued Milwaukee and other cities to stop them from dumping sewage into Lake Michigan, the Court decided that the federal common law of public nuisance had not been displaced, despite the fact that Congress had by that time "enacted numerous laws touching interstate waters." 406 U.S. at 101–07, 92 S.Ct. 1385. Laws that touched on the issue at hand were not enough, and thus the common-law action could move forward. At the same time, however, the Court foreshadowed that federal legislation "may in time pre-empt the field of federal common law of nuisance." *Id.* at 107, 92 S.Ct. 1385. Six months after *Milwaukee I,* Congress passed sweeping amendments to the Federal Water Pollution Control Act (FWPCA), and nine years after its first decision, the Court decided in *Milwaukee II* that those amendments displaced federal common law in the area. 451 U.S. at 317–18, 101 S.Ct. 1784. The Court viewed the amended statute as "a comprehensive regulatory program supervised by an expert administrative agency," and it noted that under that regulatory program "[e]very point source discharge is prohibited unless covered by a permit." *Id.* at 317–18, 101 S.Ct. 1784. This permitting requirement brought every potential interstate water polluter within Congress's administrative scheme; any discharge had to be done with the permission of the EPA or a qualifying state agency; and there were enforcement options available when polluters failed to meet the conditions of permits that had been issued. See *id.* at 310–11, 101 S.Ct. 1784.

Most recently, *American Electric Power* held "that the Clean Air Act and the EPA actions it authorizes displace any federal common law right to seek abatement of carbon-dioxide emissions from fossil-fuel fired power plants." 131 S.Ct. at 2537. The Court found it important that the Clean Air Act requires the EPA to identify and establish performance standards for all carbon-dioxide emitters; the statute also "provides multiple avenues for enforcement," which include state agencies (operating under power delegated by EPA), the EPA itself, criminal proceedings against violators, and private enforcement in the event that the EPA or the states fail to regulate emissions. If the EPA has not acted, states and private parties may petition the agency for a rulemaking, after which parties have a right to review in federal court. *Id.* at 2537–38. The Court concluded with the observation that "[t]he Act itself thus provides a means to seek limits on emissions of carbon dioxide from domestic power plants—the same relief the plaintiffs seek by invoking federal common law. We see no room for a parallel track." *Id.* at 2538.

For better or for worse, congressional efforts to curb the migration of invasive species, and of invasive carp in particular, have yet to reach the level of detail one sees in the air or water pollution schemes. In 1990, Congress passed the Aquatic Nuisance Prevention and Control Act in an attempt to stop the spread of zebra mussels and other nuisance species. See 16 U.S.C. §§ 4701 *et seq.* That statute established the Aquatic Nuisance Species Task Force and gave it the job of studying invasive species and implementing a program "to prevent introduction and dispersal of aquatic nuisance species" in the United States. See *id.* § 4722. In 1996, the National Invasive Species Act amended the 1990 law and directed the Corps and the task force

to "investigate and identify environmentally sound methods for preventing and reducing the dispersal of aquatic nuisance species between the Great Lakes [basin] and the Mississippi River [basin] through the Chicago River Ship and Sanitary Canal," including any methods that could be incorporated in the normal operation of the CAWS. *Id.* § 4722(i)(3)(A). This mandate led to the construction of an underwater electric barrier in the Chicago Ship and Sanitary Canal. The barrier sits just upstream of the point where the CAWS empties into the Des Plaines River; it is designed to deter fish from moving in either direction through the canal. In 2003 the Corps, relying on the continuing authority given to the Secretary of the Army in 33 U.S.C. § 2309a, began construction of a second barrier next to the first. The barrier projects received an additional influx of cash from the District of Columbia Appropriations Act of 2005, Pub.L. 108–335, § 345, 118 Stat. 1352 (Oct. 18, 2004). In 2007, Congress passed the Water Resources Development Act, Pub.L. No. 110–114, § 3061(b)(1), 121 Stat. 1121 (Nov. 8, 2007), which allowed the Corps to upgrade its first barrier and officially authorized the construction of the already-in-progress second barrier. Finally, the Corps received more money to complete a third barrier as part of the American Reinvestment and Recovery Act of 2009.

Sections 3061(b) and (d) of the Water Resources Development Act of 2007, *supra,* instructed the Corps to undertake two studies: a short-term examination of how the electric barrier systems might more effectively stop invasive species (this is the Efficacy Study, which so far consists of four interim reports, see http://www.lrc.usace.army.mil/AsianCarp/efficacy.htm); and a long-term study of how the Mississippi and Great Lakes basins might be separated on a more permanent basis (this is the Great Lakes and Mississippi River Interbasin Study or "GLMRIS," see http://glmris.anl.gov). In an appropriations bill for fiscal year 2009, Congress provided that "the Secretary of the Army shall implement measures recommended in the efficacy study, or provided in interim reports, authorized under section 3061 of the Water Resources Development Act of 2007 ... with such modifications or emergency measures as the Secretary of the Army determines to be appropriate, to prevent aquatic nuisance species from bypassing the Chicago Sanitary and Ship Canal Dispersal Barrier Project referred to in that section and to prevent aquatic nuisance species from dispersing into the Great Lakes." Energy and Water Development and Related Agencies Appropriations Act 2010, Pub.L. No. 111–85, § 126, 123 Stat. 2845, 2853 (Oct. 28, 2009). This authority—referred to informally as the Section 126 power—is set to expire on September 30, **2011**. Department of Defense and Full–Year Continuing Appropriations Act **2011**, Pub.L. No. 112–10, §§ 1101(a)(2), 1104, 1106, 125 Stat. 38, 103 (Apr. 15, **2011**). Add to these measures the appropriation of funds so that the Corps can ensure proper operation of the CAWS, *e.g.,* Pub.L. No. 98–63, 97 Stat. 301, 311 (July 30, 1983); Pub.L. No. 97–88 § 107, 95 Stat. 1135, 1137 (Dec. 4, 1981); Pub.L. No. 79–525, 60 Stat. 634, 636 (July 24, 1946), and one has the whole of Congress's efforts to stop invasive species from moving through the CAWS. Recent legislative proposals targeted at halting invasive carp have failed in both Houses. *E.g.,* Close All Routes and Prevent **Asian Carp** Today Act of 2010 (CARP ACT), H.R. 4472, S. 2946.

Although this legislation demonstrates that Congress is aware of the problem of invasive species generally, and carp in particular, it falls far short of the mark set by the Clean Air Act or the Federal Water Pollution Control Act. Congress has not passed any substantive statute that speaks directly to the interstate nuisance about which the states are complaining. Most of the laws that we have summarized appropriate funds to the Corps for routine maintenance of the CAWS or for the electric barrier project. Apart from requiring the construction of these barriers and giving the Secretary of the Army temporary power to implement various recommendations, Congress has ordered agencies (or, more commonly, informal task forces composed of various executive actors) only to study the invasive species problem and propose solutions. Beyond that, neither the Corps nor any other agency has been empowered actively to regulate the problem of invasive carp, and Congress has not required any agency to establish a single standard to deal with the problem or to take any other action. The narrow delegation that has taken place bears little resemblance to the regulatory power that the EPA wields under the Clean Air Act. Tellingly, Congress has not provided any enforcement mechanism or recourse for any entity or party negatively affected by the carp, and there is certainly no recourse to the courts under the minimal scheme that has been established. The district court was correct that the current state of congressional regulation is much closer to the situation examined in *Milwaukee I*—and perhaps even less extensive than that—than the regimes reviewed in *Milwaukee II* or *American Electric Power.*

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D

With these important preliminary questions out of the way, we are at last ready to consider whether the plaintiff states have presented enough evidence in support of their nuisance claim to establish that they are likely to succeed on the merits. The district court thought that the states failed to demonstrate more than a minimal chance of success. Before this court, the states contend that the district court misunderstood the elements of public nuisance. They point to the district judge's statement that the tort "contemplates an active—or, at least, an imminent—threat of injury" as evidence of that error. In their view, all they must show to win final relief in a trial on the merits is that there is a "significant threat" that the nuisance will occur. This is a distinction without a difference; the district court correctly understood the law of public nuisance. Nonetheless, for different reasons we think that the district judge may have underestimated the states' likelihood of success. We will elaborate on this point after a brief review of the governing law.

1

The district court began with the definition of public nuisance found in the *Restatement (Second) of Torts,* which has been a common reference point for courts considering cases arising under federal common law. See *Connecticut v. American Electric Power Co., Inc.*, 582 F.3d 309, 351 & n. 28 (2d Cir.2009), *rev'd on other grounds, American Electric Power,* 131 S.Ct. 2527 (explaining that "[t]he Restatement definition of public nuisance has ... been used in ... federal cases involving the federal common law of nuisance ... and the Restatement principles have served as the backbone of state nuisance law"). The *Restatement* provides that "[a] public nuisance is an unreasonable interference with a right common to the general public," RESTATEMENT (SECOND) OF TORTS § 821B(1), and it goes on to explain that conduct meets this standard when it interferes significantly with the public health, safety, peace, comfort, or convenience, *id.* § 821B(2)(a). We described above the reasons why the federal common law of public nuisance is available to redress the type of harm that the states have alleged. And all sides agree that if invasive carp were to achieve a sustainable population in the Great Lakes, the environmental and economic impact would qualify as an unreasonable interference with a public right. As the district court noted, the Corps and other agencies have repeatedly and publicly acknowledged the seriousness of the problem. The Corps, for example, has said that invasive carp "have the potential to damage the Great Lakes and confluent large riverine ecosystems," and that it regards "[t]he prevention of an inter-basin transfer of bighead and silver carp from the Illinois River to Lake Michigan [as] paramount in avoiding ecologic and economic disaster." As a result, the central question on the merits of the states' public nuisance claim will be whether the harm that the states have described is sufficiently close to occurring that the courts should order the defendants to take some new action that will be effective to abate the public nuisance. We stress at the outset an important point to which we will return: this question is one that will be resolved after a full trial on the merits, rather than at this preliminary stage of the case.

[8] A court may grant equitable relief to abate a public nuisance that is occurring or to stop a threatened nuisance from arising. See *Tennessee Copper,* 206 U.S. at 238–39, 27 S.Ct. 618 (requiring the plaintiff to show that a defendant's actions "cause and threaten damage"). In *Missouri v. Illinois,* 200 U.S. at 518, 26 S.Ct. 268, the Court wrote that the threatened harm underlying the nuisance claim "must be shown to be real and immediate." We have read the Court's cases to say that "[t]he elements of a claim based on the federal common law of nuisance are simply that the defendant is carrying on an activity that is causing an injury or significant threat of injury to some cognizable interest of the complainant," *Illinois v. City of Milwaukee,* 599 F.2d 151, 165 (7th Cir.1979), *rev'd on other grounds, Milwaukee II,* 451 U.S. 304, 101 S.Ct. 1784. Additional statements about averting threatened nuisances appear in the *Restatement,* see RESTATEMENT (SECOND) TORTS § 821B cmt. (i) ("[F]or damages to be awarded [in public nuisance cases] significant harm must have been actually incurred, while for an injunction harm need only be threatened and need not actually have been sustained at all."); *id.* § 821F cmt. (b) ("[E]ither a public or a private nuisance may be enjoined because harm is threatened that would be significant if it occurred."), and in other treatises, see, *e.g.*, 5 J. POMEROY, A TREATISE ON EQUITY JURISPRUDENCE AND EQUITABLE REMEDIES, § 1937 (§ 523), at 4398 (2d ed.1919) (noting that while "a mere possibility of a future nuisance will not support an injunction," relief will be warranted when "the *risk* of its happening is greater than a reasonable man would incur").

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[9] The plaintiffs believe that the district court's "imminent threat" requirement is inconsistent with these principles, but we do not share that view. The district court reproduced *verbatim* the elements of the claim as we described them in *Illinois v. City of Milwaukee, supra.* Its discussion of "immediacy" did nothing more than flesh out the Court's requirement of a "real and immediate" threat in public nuisance cases. There is no meaningful legal difference for purposes of the ultimate resolution of a public nuisance claim between a threatened nuisance that is "imminent" and one that is "immediate," "significant," "real," an "unreasonable risk," or anything similar. The job of a court considering the merits of a public nuisance claim is simply to determine whether the activity complained of is a nuisance and, if so, whether it is sufficiently close to occurring that equitable relief is necessary to prevent it from happening.

2

We part company with the district court when it comes to the assessment of the states' likelihood of success on the merits. Here we think it critical to bear in mind the difference between preliminary or interim relief, on the one hand, and permanent relief, on the other. The principles that we just reviewed relate to the ultimate outcome of a public nuisance proceeding. This case has not yet reached that stage, and one consequence of its preliminary posture is that the states were not required to prove that they will ultimately win on the merits in order to secure preliminary relief.

[10] "The propriety of preliminary relief and resolution of the merits are of course significantly different issues." *Parents Involved in Cmty. Schs. v. Seattle Sch. Dist. No. 1,* 551 U.S. 701, 721 n. 10, 127 S.Ct. 2738, 168 L.Ed.2d 508 (2007) (internal quotation marks omitted). This is the reason why findings made at the preliminary injunction stage do not bind the district court as the case progresses. *Cf. Guaranty Bank v. Chubb Corp.,* 538 F.3d 587, 591 (7th Cir.2008). The most significant difference between the preliminary injunction phase and the merits phase is that a plaintiff in the former position needs only to show "a likelihood of success on the merits rather than actual success." *Amoco Prod. Co. v. Village of Gambell,* 480 U.S. 531, 546 n. 12, 107 S.Ct. 1396, 94 L.Ed.2d 542 (1987); *cf. Chathas v. Local 134 Int'l Bhd. of Elec. Workers,* 233 F.3d 508, 513 (7th Cir.2000) ("A plaintiff cannot obtain a permanent injunction merely on a showing that he is likely to win when and if the merits are adjudicated."). In some cases, it is necessary to expedite an ultimate decision, and so courts sometimes consolidate the preliminary injunction hearing with the trial on the merits. See FED.R.CIV.P. 65(a)(2). But where such consolidation has not taken place—and it has not here—and the question is the propriety of preliminary relief, the Supreme Court has warned against "improperly equat[ing] 'likelihood of success' with 'success'...." *University of Texas v. Camenisch,* 451 U.S. 390, 394, 101 S.Ct. 1830, 68 L.Ed.2d 175 (1981); see also *Meridian Mut. Ins. Co. v. Meridian Ins. Group, Inc.,* 128 F.3d 1111, 1119 (7th Cir.1997). This is in keeping with the often-repeated rule that the threshold for establishing likelihood of success is low. *E.g., Cooper v. Salazar,* 196 F.3d 809, 813 (7th Cir.1999); *Brunswick Corp. v. Jones,* 784 F.2d 271, 275 (7th Cir.1986).

[11] We are concerned that the district court here may have lost sight of this distinction. By applying directly the law of public nuisance, the judge seems to have required the plaintiff states actually to show that they were entitled to permanent injunctive relief during the preliminary injunction hearing. The court concluded its discussion of the threat posed by invasive carp, for example, by saying that the states "ha[d] not made a convincing case" that the fish had pushed into the CAWS in significant numbers; and it said that the plaintiffs had not "shown that the fish [are] anywhere near ... establishing a population in Lake Michigan." Because the states had not yet shown that the threat of nuisance was great enough in the final analysis to warrant an injunction to abate it, the district court seems to have assumed that they had also failed to show enough to obtain preliminary relief. To demonstrate the requisite likelihood of success, however, the states needed only to present a claim plausible enough that (if the other preliminary injunction factors cut in their favor) the entry of a preliminary injunction would be an appropriate step. The preliminary injunction, after all, is often seen as a way to maintain the *status quo* until merits issues can be resolved at trial. By moving too quickly to the underlying merits, the district court required too much of the plaintiffs and, correspondingly, gave too little weight to the strength of their claim at this stage of the case.

3

We also question the inferences drawn by the

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district court from the facts that it so carefully found after evaluating five days of hearings, which included the testimony of expert witnesses and volumes of written materials on complex scientific and engineering issues. There is very little to criticize about the court's factual findings themselves. For instance, the district judge's decision to admit the expert testimony of Dr. David Lodge, who has been hired by the Corps and who testified for the states at the preliminary injunction hearing about his efforts to track invasive carp through the use of environmental DNA (eDNA) testing, reflects a proper application of Federal Rule of Evidence 702. (We agree that any lack of peer review of Dr. Lodge's work would go to the weight of his testimony, not to the court's ability to consider it. Moreover, the situation will be different at the merits phase, given Dr. Lodge's recent publication of his research. See Christopher L. Jerde, Andrew R. Mahon, W. Lindsay Chadderton & David M. Lodge, "*Sight Unseen* " *Detection of Rare Aquatic Species Using Environmental DNA,* 4 Conservation Letters 150 (April/May **2011**).) We also see nothing to criticize in the district court's assessment that the electric barriers built by the Corps near the intersection of the Chicago Sanitary and Ship Canal and the Des Plaines River seem to have at least some deterrent effect on the movement of invasive carp toward the Great Lakes. In addition, we consider it significant, as the district judge did, that efforts to detect carp by techniques including netting, so-called electrofishing, and rotenone poisoning, have led to few signs of the carp.

Along the same lines, the district court was right to take into account the results of eDNA testing. Despite its skepticism about the reliability of the technique and its concern that the state of eDNA science "did not permit a reasonable inference that live **Asian carp** are in the [CAWS] ... in numbers that present an imminent threat," the court acknowledged that the eDNA evidence lent some support to the conclusion that there may be invasive carp above (*i.e.,* lakeside of) the Corps's electric barriers. Although we are less skeptical of the science than the district court, we too believe that caution in drawing inferences from the existence of carp DNA in the water is warranted. The eDNA technique, which tests water samples for markers matching a particular species, has a number of shortcomings: it is difficult, if not impossible, to know definitively whether a positive result signals a living specimen above the barrier (DNA may be shed by a dead or distant fish); a positive test does not reveal the number of live fish; and negative results do not necessarily signal the absence of carp. Efforts to corroborate eDNA results with traditional methods of capturing fish have not been successful thus far. On the other hand, the evidence is worth something. The eDNA technique detects carp when the fish are present in small numbers and in situations where the other fishing methods we described above might scare them away or simply miss them, and the large number of negative test results make sense given the sensitivity of the technique. In addition, the Corps and other agencies have voted with their feet: they have been using eDNA tests to manage the invasive carp crisis, and they have said that this testing will continue. (This is undoubtedly why the private intervenor-defendants are the primary critics of this methodology.) If the tests are good enough for expert agencies, it is hard to see why we should flatly forbid their consideration. A January **2011** report on eDNA sampling conducted in 2010 showed positive eDNA results in approximately a dozen locations throughout the CAWS, and experts have opined that these results indicate the presence of carp at multiple locations in the CAWS. On July 29, **2011,** federal officials announced that they would begin daily efforts to find invasive carp around Lake Calumet, after multiple rounds of testing revealed carp DNA in that area. See **Asian Carp** Regional Coordinating Committee, Press Release, July 29, **2011,** http://asiancarp.org/news/ **asian-carp**-r egional-coord inating-commi ttee-to-begi n-intensive-m onitoring-i n-lake-calume t-in-respons e-to-environ mental-dna-r esults; Tammy Webber, *Feds to Step Up Hunt for **Asian Carp** Near Chicago,* Chicago Tribune, July 29, **2011**. The district court thought that this evidence, in combination with the discovery of two invasive carp specimens (one dead and one living) in the CAWS, supported a theory that invasive carp are present in the CAWS in "low numbers." This conclusion was reasonable. The carp may even be present in greater numbers, but for present purposes we do not need any more precision.

Our greatest hesitation with respect to the district court's findings is over its conclusion that "it is far from certain that **Asian carp** can survive and reproduce in the Great Lakes." Given the record that was before Judge Dow, this prediction may have been sound at the time he ruled. The situation has been evolving rapidly since the preliminary injunction hearing, however, and so we think it worth mentioning that the newest publicly available evidence suggests that when and if the time comes, the carp are unlikely to have trouble establishing themselves in the Great

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Lakes. Before the district court there was testimony reflecting great uncertainty about how easily the carp could live and reproduce in this new habitat. A species typically requires multiple introductions before it takes root in a new ecosystem, and there has been a substantial debate, reflected in the literature, about whether the food supply and other features of the Great Lakes could support the carp. See generally Sandra L. Cooke & Walter R. Hill, *Can Filter–Feeding* ***Asian Carp*** *Invade the Laurentian Great Lakes? A Bioenergetic Modelling Exercise,* 55 Freshwater Biology 2138 (2010); Cynthia S. Kolar & David M. Lodge, *Ecological Predictions and Risk Assessment for Alien Fishes in North America,* 298 Science 1233 (2002). On April 28, **2011**, however, the Obama Administration presented two pieces of what it called "bad news" at a meeting in Chicago on invasive carp: first, it said that while it was once thought that the carp could not establish breeding populations in Lake Michigan because of the low levels of plankton (the carp's normal food source) in the water, new evidence suggests that the fish will happily switch from eating plankton to consuming the green algae that now covers the lake floor (thanks to another invasive species, the zebra mussel); and (2) while experts had thought the carp need coastal rivers between 30 and 60 miles long to spawn, it turns out they can make do with much shorter breeding grounds. See, *e.g.,* ***Asian Carp*** *Possibly Hardier than Once Thought,* Chicago Tribune, Apr. 28, **2011**. At this point, therefore, we must assume that once in the Great Lakes, the invasive carp would make it their home.

We need not explore the factual record further. As we have said, our review of the district court's findings is deferential, and we see nothing that demands correction. The critical point is that this record is not a static thing. The district court will undoubtedly have more evidence before it when it is time to rule on the request for a permanent injunction, and we are confident that the court will keep its mind open to the implications of any new information. For purposes of assessing the need for preliminary relief, the court relied on its findings that at best a limited number of invasive carp were present in the CAWS and its observation that the so-called invasion front was approximately 30 miles downstream of the CAWS (60 miles from Lake Michigan) as of the spring of 2009. On this basis, it reached the conclusion that while the potential for damage to the Great Lakes is high, the problem had not advanced far enough to present a threat to the plaintiff states. From that it drew the conclusion that the states had shown little likelihood of success on the merits.

It is that final step that gives us trouble. As the district court rightly noted, the magnitude of the potential harm here is tremendous, and the risk that this harm will come to pass may be growing with every passing day. (It certainly has grown since the ill-fated day around 1970 when the carp escaped from various aquaculture facilities and began their march up the Mississippi River. See generally Wisconsin Dep't of Nat. Res., Bighead and Silver Carp (*Hypophthalmichthys nobilis* and *H. molitrix*), http://dnr.wi.gov/invasives/fact/asian_carp.htm.) Given the magnitude of the harm, we are inclined to give the benefit of the doubt to the states on the question whether they have shown enough of a risk of nuisance to satisfy the likelihood-of-success requirement at this preliminary stage. See *Van De Sande v. Van De Sande,* 431 F.3d 567, 570 (7th Cir.2005) ("The gravity of a risk involves not only the probability of harm, but also the magnitude of the harm if the probability materializes.") (citing *United States v. Carroll Towing Co.,* 159 F.2d 169, 173 (2d Cir.1947)). In addition, the nature of the threat—an ecological harm—suggests that a broader perspective on the problem might be necessary. It is hard to see 60 miles of separation between the carp invasion front and the Great Lakes (and remember this was the estimated distance more than two years ago) as a particularly safe margin, even with functioning electric barriers to deter fish and efforts to reduce propagule pressure (the volume of invasive carp in the water downstream of the front). It is especially chilling to recall that in just 40 years the fish have migrated all the way from the lower Mississippi River to within striking distance of the lakes and have come to dominate the ecosystem in the process. Commercial harvesting of carp in the Mississippi basin increased from just over five tons to 55 tons in the three-year period from 1994 to 1997; there is evidence that by 1999 invasive carp made up 97% of the Mississippi's biomass; and as of 2007 commercial fishers were catching 12 tons of invasive carp *each day.* These numbers are sobering even apart from the hints that some of the fish may have made it into the CAWS already.

In our view, the proper inference to draw from the evidence is that invasive carp are knocking on the door to the Great Lakes. We need not wait to see fish being

pulled from the mouth of the Chicago River every day before concluding that a threat of a nuisance exists. It is enough that the threat is substantial and that it may be increasing with each day that passes. Unlike many nuisances that can be eliminated after they are discovered, this one in all likelihood cannot be. The fact that it would be impossible to un-ring the bell in this case is another reason to be more open to a conclusion that the threat is real. In our view, the plaintiff states presented enough evidence to establish a good or even substantial likelihood of success on the merits of their public nuisance claim.

III

Before moving on to the other preliminary injunction factors, there are some particular questions about the APA claim against the Corps that we must address. We turn again to § 702 of the APA, which authorizes a suit by "[a] person suffering legal wrong because of agency action, or adversely affected or aggrieved by agency action within the meaning of a relevant statute." 5 U.S.C. § 702. A reviewing court is required to "compel agency action unlawfully withheld or unseasonably delayed," 5 U.S.C. § 706(1), and to "set aside agency action ... found to be ... arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law," *id.* § 706(2)(A). The states do not ask us to compel the Corps to take action, at least as far as § 706(1) is concerned. *Norton v. Southern Utah Wilderness Alliance,* 542 U.S. 55, 64, 124 S.Ct. 2373, 159 L.Ed.2d 137 (2004), explains that "a claim under § 706(1) can proceed only where a plaintiff asserts that an agency failed to take a *discrete* agency action that it is *required to take* "; the states have named no action that they think the agency is required to take. We understand the states' argument as a request to set aside agency action that they regard as unlawful within the meaning of § 706(2)(A).

[12] The obvious starting point is to identify the final Corps action that the states assert has affected them. See 5 U.S.C. § 704; *Lujan v. National Wildlife Fed'n,* 497 U.S. 871, 882, 110 S.Ct. 3177, 111 L.Ed.2d 695 (1990). The states contend that five such actions fit the bill. They say that the Corps's (1) operation of the CAWS in a manner that will let invasive carp into Lake Michigan, (2) reliance on ineffective electric barriers, (3) use of locks in areas where living and dead carp have been found, (4) denial of the states' requests for additional relief, and (5) implementation of recommendations contained in the Corps's third interim report (which is part of the Efficacy Study we discussed in connection with our analysis of displacement, *supra*) are all final agency actions. The district court equivocated on the issue, but it seems to have agreed with the states in the end.

[13] There is a good chance that most of the "actions" named by the states are not "final agency actions" for purposes of the APA. "Agency action" is defined as "the whole or a part of an agency rule, order, license, sanction, relief or the equivalent or denial thereof, or failure to act," 5 U.S.C. § 551(13). The Supreme Court has explained that these categories all "involve circumscribed, discrete agency actions," *Norton,* 542 U.S. at 62, 124 S.Ct. 2373. Agency action is "final" when it marks the consummation of the agency's decisionmaking process and determines legal rights or obligations. *Bennett v. Spear,* 520 U.S. 154, 177–78, 117 S.Ct. 1154, 137 L.Ed.2d 281 (1997); see also *Western Illinois Home Health Care, Inc. v. Herman,* 150 F.3d 659, 662 (7th Cir.1998) (citing *Franklin v. Massachusetts,* 505 U.S. 788, 112 S.Ct. 2767, 120 L.Ed.2d 636 (1992), for the proposition that "[t]he core question is whether the agency has completed its decisionmaking process, and whether the result of that process is one that will directly affect the parties"). Applying these standards, we cannot see why any of the "actions" that are numbered 1 through 4 on the states' list of complaints above should be considered final agency action. Most of the four "actions" are not discrete at all; and those that might be so classified do not represent the final outcome of any decisionmaking process by the Corps. The Corps's effort to implement its third interim report—which recommended the installation of screens over two gates that control water flow between the CAWS and Lake Michigan but which otherwise called for normal operation of lake-facing locks—is the only activity that may be suitable for an APA challenge. We need not evaluate that claim in any detail, however, because it is part of the states' larger request for relief based on the common law of public nuisance.

Two types of plaintiffs are given a right of review in § 702: those suffering a "legal wrong," and those "adversely affected or aggrieved by agency action within the meaning of a relevant statute." In their briefs in this court, the states have not pointed to a single statute against which one might judge the Corps's behavior. (This is not surprising, given the dearth of pertinent federal legislation that we dis-

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cussed in connection with displacement.) The Corps submits that this means that the states have no APA claim; the states respond their APA claim is "free-standing." Neither answer is satisfactory. We know that the states have not alleged that the Corps's actions failed to comply with some statutory provision, and so they must instead be asserting that they have suffered a "legal wrong" because of those actions. The only legal wrong that comes to mind, however, is the infliction of a common-law public nuisance. See *Lujan,* 497 U.S. at 883, 110 S.Ct. 3177 (distinguishing between legal wrongs and the failure of an agency to comply with a statutory provision); *Tennessee Electric Power Co. v. Tennessee Valley Authority,* 306 U.S. 118, 137, 59 S.Ct. 366, 83 L.Ed. 543 (1939) (explaining that "legal wrong" includes tortious invasions and interferences with property and contractual rights). See generally Antonin Scalia, *The Doctrine of Standing as an Essential Element of the Separation of Powers,* 17 SUFFOLK. U.L.REV.. 881, 887–90 (1983) (discussing the use of the term "legal wrong" in the APA and explaining that it "could only mean a wrong already cognizable in the courts"). The result is that the states' APA claim against the Corps sinks or swims (so to speak) with its public nuisance theory. Because they are indistinguishable, we address only the latter from this point on.

IV

To satisfy the second threshold requirement for preliminary injunctive relief, the states must establish that irreparable harm is likely without an injunction. *Judge v. Quinn,* 612 F.3d 537, 557 (7th Cir.2010). In the district court's view, this issue was the same as the question whether the states had shown a likelihood of success on the merits of their public nuisance claim. The states contend that it was error to conflate these inquiries. They are right. In this case, for example, the likelihood of success on the merits focuses on the threat of a nuisance, while the irreparable harm is concerned with the ability to correct that nuisance if it is created. Not every nuisance will give rise to irreparable harm. These two steps of the preliminary injunction analysis thus play different roles. The likelihood of success on the merits is an early measurement of the quality of the underlying lawsuit, while the likelihood of irreparable harm takes into account how urgent the need for equitable relief really is. Typically, these lines of inquiry will have some overlap, but they should not be treated as the same. With that in mind, we realize that the same evidence will inform both steps of the preliminary injunction analysis in this case. As long as the distinctions we have just mentioned remain clear, there is no harm in analyzing all of the evidence once rather than twice. As a result, the states' criticism of the district court is largely academic and provides no reason to reverse that court's decision.

[14] Putting theory to one side, we have very little trouble concluding that the environmental and economic harm that the states have shown might come to pass would be genuinely irreparable if it did occur. The district court implied that this was the case when it discussed the magnitude of the potential harm. Last year in Supreme Court filings related to this litigation, the United States explained in a memorandum that it agreed with Michigan "that allowing a reproducing population of **Asian carp** to establish itself in Lake Michigan likely would be an irreparable injury." Memorandum in Opposition of the United States, at 43, Original Nos. 1, 2, and 3, http://www.supremecourt.gov/SpecMastRpt/US_Memorandum_in_Opposition.pdf; see also *id.* at 47 (calling the harm "grave and irreparable"). All of the other parties seem to agree with this view. (To the extent that the defendants argue that there is no irreparable harm because the carp cannot establish a breeding population in Lake Michigan, they are avoiding the key question: what if the fish did establish a successful breeding group?) This near-unanimity on the question of irreparable injury makes sense. "Environmental injury, by its nature, can seldom be adequately remedied by money damages and is often permanent or at least of long duration, *i.e.,* irreparable." *Amoco Prod.,* 480 U.S. at 545, 107 S.Ct. 1396; *Sierra Club v. Franklin County Power of Illinois, LLC,* 546 F.3d 918, 936 (7th Cir.2008). Harms like those the states allege here are irreparable because they are difficult—if not impossible—to reverse. See *Hollingsworth v. Perry,* —— U.S. ——, 130 S.Ct. 705, 712, 175 L.Ed.2d 657 (2010) (per curiam).

[15] For preliminary relief to be granted, the irreparable harm must also be likely. That is, there must be more than a mere possibility that the harm will come to pass, *Winter,* 555 U.S. at 21–23, 129 S.Ct. 365, but the alleged harm need not be occurring or be certain to occur before a court may grant relief, *United States v. W.T. Grant Co.,* 345 U.S. 629, 633, 73 S.Ct. 894, 97 L.Ed. 1303 (1953); *United States v. Oregon State Med. Soc'y,* 343 U.S. 326, 333, 72 S.Ct. 690, 96 L.Ed. 978 (1952); *Bath Indus., Inc. v. Blot,* 427 F.2d

97, 111 (7th Cir.1970). Commentators describe the required level of certainty this way: "[A] preliminary injunction will not be issued simply to prevent the possibility of some remote future injury. A presently existing actual threat must be shown. However, the injury need not have been inflicted when application is made or be certain to occur." 11A CHARLES ALAN WRIGHT, ET AL., FEDERAL PRACTICE AND PROCEDURE § 2948.1, at 154–55 (2d ed.1995). Because the district court analyzed likelihood of success on the merits at the same time as it assessed the danger of irreparable harm, all of the reservations we had about the inferences drawn by the district court in the former context apply with equal force here.

As we have already pointed out, no one knows whether this irreparable harm will come to pass. The intense factual dispute we are witnessing here about the rate at which invasive carp are progressing makes evaluating its likelihood even more tricky. In our view, the district court required a level of proof too close to certainty when it assessed the danger of invasive carp escaping into Lake Michigan. Given the dire nature of the harm posed by the carp and their close proximity to the CAWS, we again will give the plaintiff states the benefit of the doubt. Just as they produced enough evidence to establish a likelihood of success on the merits warranting injunctive relief, so too have they shown, to the degree necessary for preliminary relief, that it is likely that irreparable harm will come to pass. This sets the stage for the dispositive issue: how must the harms the states have identified be balanced against those that the defendants will suffer should an injunction be granted?

V

[16] The balancing process to which we now turn is a classic part of any preliminary injunction inquiry. See *Winter,* 555 U.S. at 24, 129 S.Ct. 365 ("A preliminary injunction is an extraordinary remedy never awarded as of right. In each case, courts must balance the competing claims of injury and must consider the effect on each party of the granting or withholding of the requested relief.") (internal quotation marks and citations omitted). How much of the danger forecast by the states would be avoided by the particular injunction they have asked for? And what harm would the injunction impose on the defendants? Typically, after we balance these party-specific equities, we evaluate whether the injunction would advance or impede the public interest. See, *e.g., Ferrell v. U.S. Dep't of Hous. and Urban Dev.,* 186 F.3d 805, 811 (7th Cir.1999). That additional analysis is not necessary in this case, however, because the parties themselves, with the exception of two interveners, are governmental entities that represent the interests of the public.

When it appears that preliminary relief may be burdensome, the Supreme Court has instructed courts to be careful as they balance the competing interests. *Winter,* 555 U.S. at 27, 129 S.Ct. 365; see also *Kartman v. State Farm Mut. Auto. Ins. Co.,* 634 F.3d 883, 892 (7th Cir. **2011**). In light of the multifarious ideas the states have for an injunction in this case, there can be no doubt that caution must be our word of the day. Even if a plaintiff's suit appears to have merit, an injunction should not necessarily issue if the harm to the defendant would substantially outweigh the benefit to the plaintiff. *MacDonald v. Chicago Park Dist.,* 132 F.3d 355, 357 (7th Cir.1997).

In the end we conclude that a preliminary injunction would cause significantly more harm that it would prevent. We reach this result for two reasons, which we summarize here before explaining the balance of harms in more detail. First, there are a number of problems with various line items in the plaintiffs' proposed package of relief. Taken together, these problems leave us doubting whether the proposed injunction would reduce by a significant amount the risk that invasive carp will gain a foothold in the Great Lakes between now and the time that a full trial on the merits is completed. It is clear, on the other side, that the requested measures would impose substantial costs on the defendants and the public interests they represent, as well as added expenses for commerce, recreation, and tourism. Second, as circumstances currently stand, there is a more fundamental reason that the states' requested injunction is unlikely to prevent much harm and actually may impose costs. The courts would not be acting alone. As we have explained, there is a powerful array of expert federal and state actors that are engaged in a monumental effort to stop invasive carp from entering the Great Lakes. The last thing we need is an injunction operating at cross-purposes with their efforts or imposing needless transactional costs that divert scarce resources from science to bureaucracy. Furthermore, from an institutional perspective courts are comparatively ill situated to solve this type of problem. The balance of harms favors the defendants and the public

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interests they represent to such an extent that we conclude that the district court's decision to deny preliminary relief was not an abuse of discretion.

A

1

It is best to begin by trying to understand precisely what preliminary relief the states would like. As the district court noted, their request has evolved as the case has moved forward. Indeed, their position has shifted even between their opening brief in this court and oral argument. The moving nature of the target complicates our job of evaluating the propriety of injunctive relief. Moreover, their request has been phrased at a high level of generality. They have given us the broad strokes of additional steps they would like us to order the defendants to take, but they have not furnished many details about how this relief would be implemented, on what schedule, at what cost, and on whose nickel. From time to time the states urge that the injunctive measures should be "consistent with public health and safety," but they do not say what precisely that means. This vagueness is unhelpful; it stands as an obstacle to the entry of an injunction that will satisfy Federal Rule of Civil Procedure 65(d). See *PMC, Inc. v. Sherwin–Williams Co.,* 151 F.3d 610, 619–20 (7th Cir.1998); see also *Patriot Homes, Inc. v. Forest River Hous., Inc.,* 512 F.3d 412, 414–15 (7th Cir.2008). When a plaintiff seeks relief of the type the states ask for here, we have required a more specific plan about the measures to be taken and the costs of implementing those measures. See *Jordan v. Wolke,* 593 F.2d 772, 774–75 (7th Cir.1978).

At this time, it is our understanding that the states believe that they are entitled to a preliminary injunction that would require the defendants to take these five steps:

a. *Closing the Locks.* Close and stop operating the locks at the Chicago River Controlling Works (the Controlling Works) and the O'Brien Lock and Dam (O'Brien), which sit at two of the five points of contact between the CAWS and Lake Michigan;

b. *Screens over Sluice Gates.* Install nine additional screens over sluice gates that are used to control water flow between the CAWS and the lake at the Controlling Works, O'Brien, and the Wilmette Pumping Station, a third contact point with Lake Michigan;

c. *Block Nets in the Rivers.* Place block nets to stop fish in the Little Calumet River, which connects the CAWS to the lake at the Burns Small Boat Harbor in Indiana, and if necessary in the Grand Calumet River, which runs between the CAWS and the Indiana Harbor and Canal (Burns Harbor and Indiana Harbor are last of the five contact points between the CAWS and Lake Michigan);

d. *Rotenone Poisoning.* Use rotenone to poison fish in the CAWS, especially in areas north of O'Brien.

e. *Accelerating GLMRIS.* Finish the part of the Great Lakes and Mississippi River Interbasin Study that relates to the CAWS, which Congress called for in the Water Resources Development Act of 2007, within 18 months.

The states have made two additional requests that do not require discussion. They say that the defendants should use the best methods to stop, capture, and kill carp that are present in the CAWS. We see this as a more general statement of the specific measures we have just outlined. In addition, the states want the defendants to continue using monitoring techniques, including eDNA testing, to search for invasive carp. But the Corps and the other agencies working on this problem are continuing eDNA monitoring efforts. In July **2011**, for example, three rounds of positive eDNA testing results led to a four-day hunt for invasive carp (none was found). This request asks for steps already being taken, and so we will not discuss it further.

2

Before we discuss the harm and benefit of the preliminary relief the states request, we must point out an error in the states' view of how the harms should be weighed. The states say that any harm the defendants might suffer because of the injunction pales "in comparison to the grave and truly irreparable harm that will occur if **Asian carp** establish a breeding population in the Great Lakes." But that is not the correct measure of the harm avoided by the states' proposed injunction. The states assume, without providing much explanation, that preliminary relief would stop invasive carp from ever reaching the Great Lakes. While that *may* be the effect that a perfectly designed permanent injunction would have, it is not an accurate measure of the harm that would be avoided

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by the states' proposed preliminary injunction. At this early point, the question is to what extent would the proposed measures decrease the risk of invasive carp establishing themselves in the Great Lakes between now and when the litigation concludes? Stepping back from the subject matter of this litigation, we note that in addition to the CAWS, the Corps has identified a total of 18 places in Minnesota, Wisconsin, Indiana, Ohio, and New York where invasive carp could move from the Mississippi basin into the Great Lakes. These pathways outside of the CAWS necessarily reduce the likelihood that the states' preliminary injunction will prevent carp from establishing themselves in the Great Lakes, because the states' proposed measures say nothing about these alternate routes. Even focusing exclusively on the CAWS, the states overlook similar limitations inherent in the steps they are proposing—limitations that would reduce the effectiveness of preliminary relief, as we now explain.

a. *Closing the Locks.* If the locks at the Controlling Works and O'Brien are closed, the states concede that the closure need not be permanent or unqualified; instead, they say, the locks may be opened if closure would put public health or safety at risk. We are not sure how that would work. The City of Chicago says that police and fire services use the locks routinely, as do Coast Guard boats. At one point, the states agreed that passage for emergency boats through the locks was needed for public safety. That sounds reasonable to us. Now, however, their injunction would allow the defendants to open the locks only when the District needs to release water from the CAWS into the lake to control flooding (during so-called "reversal" operations). The states' proposed injunction is made more effective by keeping the locks closed to all boat traffic, but in so doing, it increases the cost to emergency services. Even in its current iteration, the efficacy of the states' plan for closing the locks is compromised because any flooding that would require the defendants to conduct reversal operations decreases the chances that the carp will be stopped—when the locks are open, water pours out of the CAWS and into Lake Michigan. (This happened most recently on July 24, **2011**, after nearly seven inches of rain fell in only two hours, see Michelle Gallardo, 2 *Locks Opened During Record Rainfall,* Chicago Tribune, July 25, **2011**, http:// abclocal.go.com/wls/story?section=news/local&id=82 70514. It also happened exactly one year before, on July 24, 2010.) A related complication concerns how effectively the locks stop fish even when they are closed. By most accounts, a watertight closure would require bulkheads to be installed on the locks. Without bulkheads, fish might slip through small openings. The states have been less than explicit about whether their ideal injunction would require bulkheads, but if it would, then all the risks of flooding come right back into the equation. Bulkheads take time to install and remove, which means that it would be very difficult to respond quickly to floods. In short, this aspect of the states' requested relief puts them into a bind: the risk of carp migration is reduced the most by closing the locks permanently with bulkheads; but that measure, as the states recognize, would dramatically escalate the costs imposed by flooding. While keeping the locks closed more often no doubt reduces the risk of fish migrating into Lake Michigan, it does not bring it down to zero. And this unquantified reduction in risk comes with an increased immediate burden on public health and safety measures.

b. *Screens over Sluice Gates.* The states encounter similar problems with their request that the defendants screen off nine additional sluice gates. The District operates these huge gates, which open and close to adjust the rate of water flow, as part of its diversion effort—the process of drawing water out of Lake Michigan and into the CAWS to maintain navigability and water quality. In addition, when heavy rains occur, sluice gates (like the locks) are opened to let water from the CAWS into the lake. There are eight sluice gates at the Controlling Works, four at O'Brien, and one in Wilmette. To prevent the migration of adult carp, the District already has installed four screens over sluice gates: two at the Controlling Works and two at O'Brien. The District uses the four screened-off gates for diversion; the other nine remain closed except during flooding.

Initially, the states wanted to force the defendants to close all of the gates, except when public health or safety might be harmed. They have revised that request so that now they ask for screens over the nine remaining sluice gates at these sites. This request would mitigate the risk of carp migration only (at best) during floods, for at other times the gates, unlike the locks, are closed anyway. Further reducing the effectiveness of this measure is the fact that in some flooding incidents where additional sluice gates must be opened, the locks must be opened as well. Screens over additional sluice gates would not do much good if fish could swim through open locks. Finally, all

available evidence suggests that it will take a long time for the District to acquire additional property, to research feasible options for a system of screens that will not become clogged with debris during flooding, and to build those screens. This means that this portion of the states' preliminary injunction might not even be in place before the full trial on the merits has concluded. For all of these reasons, we think that installing screens over sluice gates will have at most a tiny effect on the odds of invasive carp making it to Lake Michigan.

c. *Block Nets in the Rivers.* The prospect of placing block nets in the Little Calumet and Grand Calumet Rivers strikes us as potentially the most effective element of the proposed relief. At the time of oral argument, the states asked that the Corps place block nets only in the Little Calumet River; at that point, a cofferdam in the Grand Calumet River prevented fish migration and alleviated the need for nets there. We will assume that were this dam removed, the states would ask the Corps to place nets in the Grand Calumet River as well. The Corps, however, has said that it is already looking at the possibility of installing nets in both waterways, but that it is concerned that flooding will increase as debris becomes caught in the nets. The states respond that block nets could be cut free and replaced with new nets if risks of flooding materialized. All of the parties are vague about the possibilities and implications of this plan. At this stage, it is enough to say that this step seems more promising than others when it comes to mitigating the risk that fish will appear in Lake Michigan. We take the Corps at its word that this option is under serious consideration and would be implemented if and when a feasible plan can be developed.

d. *Rotenone Poisoning.* In contrast to the block net idea, the suggestion that the Corps use rotenone to poison fish in the CAWS seems untenable to us. Rotenone is a chemical that acts as a piscicide when it is released in a body of water. Though humans would not digest much of it if it were ingested, rotenone enters the bloodstream of a fish through the gills, causing death quickly. Rotenone dumped into a river kills the vast majority of fish living there; when dead, they usually float to the surface. The poison generally is less dangerous to other animals, but it is toxic and its toxicity varies depending on the species. See generally Cornell University, Resource Guide for Organic Insect and Disease Management, Material Fact Sheets—Rotenone, http://web.pppmb.cals.cornell.edu/resourceguide/mfs/11rotenone.php. It is unclear just how the states' proposal for rotenone use differs from what the Corps is already doing in the CAWS. We know that the states would like poison to be applied near O'Brien, but there is no indication how often or where else it might be used. In May 2010, the Corps and other agencies used the poison to search for fish in a two-mile stretch of the Little Calumet River. Dozens of tons of fish were killed, and no specimens of invasive carp were found. While poisoning may be an effective way to search for elusive carp in some circumstances, the record does not explain why ordering the Corps to poison the CAWS on a regular basis would be a sound step toward reducing the risk that invasive carp will migrate into the Great Lakes.

e. *Accelerating GLMRIS.* That brings us to the aspect of the proposed injunction that would require the Corps to accelerate its long-term study of ways in which it might permanently prevent the migration of invasive species (including, but not limited to, the carp) between the Great Lakes and the Mississippi basins. The states raise a side issue here, saying that the district court erred when it denied their request to expedite GLMRIS because it failed to make the findings required by Federal Rule of Civil Procedure 52(a)(2). The argument is frivolous. The district court explained its reasons for denying all of the relief that the states sought. The court had—and will continue to have as the case moves forward—the power to grant or deny equitable measures either in whole or in part. It did not need to discuss every facet of the relief requested.

According to the Corps, GLMRIS examines every potential pathway between the two watersheds and proposes solutions to stop migration through each one. Examination of the CAWS, which the Corps intends to finish by 2015, is just one portion of the study. The Corps adds that it has the power to implement solutions that are devised as the study progresses. The states would like the court to order the Corps to finish the CAWS portion of GLMRIS within 18 months. They are not the only ones who have criticized the study for taking too long; the City of Chicago and others have as well. See, *e.g.*, Dan Egan, *Chicago Urges Army Corps to Report on Carp Sooner*, Milwaukee Journal Sentinel, Apr. 10, **2011**, http://www.jsonline.com/news/wisconsin/119547049.

html. It may well be that faster action is appropriate if possible; and, as the Corps conceded during oral argument, it may be necessary for the Corps to implement measures devised through GLMRIS on a rolling basis. But we do not see how a preliminary injunction that would essentially ask the Corps to study harder and think faster would reduce the odds that invasive carp will establish themselves in the short term.

When we take all five aspects of the states' proposed injunction together, we can say only that there is some evidence that the relief sought would reduce by an undefined amount the risk of carp establishing a breeding population in the Great Lakes. It is equally apparent, however, that the steps the states have proposed offer no assurance that they will block the carp over the short run or, over the long run, that they will save the Great Lakes ecosystem and the $7 billion industry that depends on that ecosystem. We must therefore turn to the other side of the equation: the harm that the proposed steps would inflict on the opponents of preliminary relief.

3

The states have adopted a rather insouciant attitude about the potential harm that their proposal might inflict. "[T]he federal government has made it clear that it is willing to spend significant resources to reduce this threat," the states write, "so the cost of a few bulkheads should not prove a serious impediment to protecting the Great Lakes." This tone continues throughout their briefs, with remarks like, "While the Corps asserts that the Coast Guard doesn't have the funds to [dock additional ships on both sides of locks that would be closed by the injunction], this is just a matter of money." Of course this dispute is in part a matter of money; but scoffing at the defendants' concerns about the costs of relief does not aid our assessment of the expense of the relief that the states want. It should go without saying in these straitened times that the federal and local governments do not have bottomless coffers. Indeed, 19 members of the plaintiff states' delegations to Congress recently voted against raising the federal borrowing limit. Nor do we understand why the states take this view when they apparently feel no obligation to contribute to the costs of averting this crisis. When we inquired at oral argument how the costs of the proposed injunction should be apportioned among the parties, the states informed us that their citizens would contribute to the costs by paying federal income taxes. This is not very helpful. Indeed, one might wonder why the federal government and the State of Illinois should be saddled with the entire cost of an injunction that is aimed at a problem that has been developing for four decades in a watershed that touches roughly half of the states in the Union.

To make matters worse, both sides throw around large numbers to make the case that the balance of harms favors their position. We have already explained why the proposed injunction is quite unlikely to prevent the states' forecasted $7 billion in harm. But the defendants invent similarly extreme costs. We are told repeatedly that almost $2 billion in cargo moves through locks in the CAWS each year. This, however, is not the cost that an injunction would impose on commercial shipping. If the locks were closed, cargo would have to be loaded from ships onto ground transportation at some point along the journey. Estimates of the cost of off-loading range from about $70 million per year (from the plaintiffs' perspective) to $150 million (according to the Corps). The intervening defendant Coalition to Save Our Waterways, which represents various business interests, tells us that closing the locks would cost $4.7 billion. We find no support in the record for that astronomical estimate. The dollar value of the harm to either side is of course difficult to calculate, but we need not settle on a precise number to resolve this appeal.

If the requested preliminary injunction were to issue, we can be sure that it would impose significant costs. First, we would have the expenses of implementing all of the measures that the states have recommended. In addition, funds that the defendants spend complying with the injunction likely would be diverted from other agency efforts to curb invasive carp. If we required the Corps to complete its long-term study within 18 months, the Corps suggests that it would not have time to study the problem comprehensively and that the study might not adequately support any proposed solutions. The prospect of closing the locks permanently, installing screens on sluice gates, and placing block nets in the CAWS increases the risk of flooding, which (to the extent that it occurs) would impose costs throughout the region. The states say that there are ways to avoid those costs. The locks, for example, could be opened at the District's discretion during flooding. But, as we have explained, this would be possible only if the states agreed that bulkheads were not necessary. (The states

argue that bulkheads could be removed by a barge and crane to permit for flood relief. Even if that were possible, stationing barges at both locks would cost thousands of dollars per day.) Screens installed over sluice gates used during flooding could become clogged, and the states' suggestion that raking systems be installed to alleviate this concern is both untested and would require significant additional expenditures. Meanwhile, closing the locks to boat traffic would have a tremendous impact. Police and fire services on which the City of Chicago relies would not be able to move from the Chicago River and other points in the CAWS to Lake Michigan, which means that the city would have to establish redundant emergency response fleets on either side of the locks. The same goes for Coast Guard operations around the CAWS. Recreational and tourist vessels would be stopped. And last but certainly not least, closed locks would mean that all commercial shipping in the area between the Great Lakes and the Mississippi would have to find alternative routes.

We can stop there. This overview demonstrates that the preliminary injunction the states have requested would impose substantial costs, yet given the current state of the record, we are not convinced that the preliminary injunction would assure much of a reduction in the risk of the invasive carp establishing themselves in Lake Michigan in the near future. That the balance of harms at this stage of the litigation favors the defendants might be enough by itself to support a conclusion that preliminary relief is not warranted, even though we have concluded that the states have demonstrated a likelihood of success on the merits and a threat of irreparable harm. See *Hoosier Energy Rural Elec. Co-op. v. John Hancock Life Ins. Co.*, 582 F.3d 721, 725 (7th Cir.2009) (describing the relation between the harm prevented by the plaintiff's proposed injunction and the strength of a plaintiff's claim for preliminary relief). Even if one were to conclude that the harms are in equipoise, however, there is a final reason why preliminary injunctive relief is not warranted. As things now stand, the case for judicial intervention is refuted by the fact that the competent federal and state actors are actively pursuing an array of efforts to solve the problem of invasive carp.

B

1

While *American Electric Power* is a case about congressional displacement of federal common law, the Supreme Court took the opportunity to touch generally on the relative competence of courts and expert agencies when it comes to solving complex environmental problems. "It is altogether fitting that Congress designated an expert agency, here, EPA, as best suited to serve as primary regulator of greenhouse gas emissions," the Court wrote, explaining further:

> The expert agency is surely better equipped to do the job than individual district judges issuing ad hoc, case-by-case injunctions. Federal judges lack the scientific, economic, and technological resources an agency can utilize in coping with issues of this order. Judges may not commission scientific studies or convene groups of experts for advice, or issue rules under notice-and-comment procedures inviting input by any interested person, or seek the counsel of regulators in the States where the defendants are located. Rather, judges are confined by a record comprising the evidence the parties present. Moreover, federal district judges, sitting as sole adjudicators, lack authority to render precedential decisions binding other judges, even members of the same court.

American Electric Power, 131 S.Ct. at 2539–40 (internal citation omitted). This limitation of the judiciary is a familiar feature of American law. See, *e.g.*, *Negusie v. Holder*, 555 U.S. 511, 129 S.Ct. 1159, 1171, 173 L.Ed.2d 20 (2009) (Stevens, J., concurring in part and dissenting in part); *Kelo v. City of New London*, 545 U.S. 469, 487–88, 125 S.Ct. 2655, 162 L.Ed.2d 439 (2005); *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528, 544–45, 125 S.Ct. 2074, 161 L.Ed.2d 876 (2005); *Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 865–66, 104 S.Ct. 2778, 81 L.Ed.2d 694 (1984); *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 194–95, 98 S.Ct. 2279, 57 L.Ed.2d 117 (1978).

Our sister circuits have explored the impact of this inherent limitation of the judicial role in cases comparable to ours. The Second Circuit has written that "[c]ourts traditionally have been reluctant to enjoin as a public nuisance activities which have been considered and specifically authorized by the government." *New England Legal Found. v. Costle*, 666 F.2d 30, 33 (2d Cir.1981). In the same vein, the Fourth Circuit recently reversed a lower court's decision to enter an injunction that would have required the TVA

to implement new emissions controls. *North Carolina, ex rel. Cooper,* 615 F.3d 291. The district court in that case entered an injunction after North Carolina sued the TVA for air pollution based on a state common-law public nuisance theory. The court of appeals concluded that granting "the injunction would encourage courts to use vague public nuisance standards to scuttle the nation's carefully created system for accommodating the need for energy production and the need for clear air." *Id.* at 296. Though the case involved a more robust regulatory scheme than the one that has been cobbled together for the invasive carp, the court's discussion is instructive insofar as it relates to the problems created when courts attempt to stop a nuisance at the same time that agencies are working to solve the problem. An approach that would allow the federal court and the EPA simultaneously to regulate a single emissions problem, said the Fourth Circuit, would result in multiple and perhaps contradictory decrees emanating from different branches of government and confusion about what standards should govern air pollution. *Id.* at 301–04. In addition, judicial action in the face of strong agency measures "would reorder the respective functions of courts and agencies." *Id.* at 304. Environmental problems require the balancing of many complicated interests, and agencies are better suited to weigh competing proposals and select among solutions. *Id.* at 305 ("[W]e doubt seriously that ... a judge holding a twelve-day bench trial could evaluate more than a mere fraction of the information that regulatory bodies can consider.").

None of this means that courts can no longer craft remedies designed to abate a public nuisance. In light of the general approach the Supreme Court took in *American Electric Power,* however, it does mean that the court should not blind itself to other remedies that are available under the law or to other measures that are actively being pursued to solve the problem. Even if legal displacement like that found in *American Electric Power* does not exist, the practical effect of agency actions might add up to displace as a matter of fact any role that equity might otherwise play. Efforts of other branches of government might be so complete that additional action ordered by a court would risk undermining agency efforts to abate the nuisance. How much the equitable power of the court has been limited by agency action will be a factual question that turns on the quality and quantity of the agency's (or, as here, agencies') efforts. This kind of institutional consideration of the court's relative ability to craft meaningful relief fits naturally in the balance-of-harms analysis. For if an injunction might hamper agency efforts or can improve upon them only slightly, that is all the more reason to conclude that the equities tilt in favor of the defendant.

2

The record in this case leaves no doubt that federal and state agencies, executive officials, and working groups have mounted a tremendous effort to halt the migration of invasive carp. As we have already mentioned, the Aquatic Nuisance Prevention and Control Act of 1990 created the Aquatic Nuisance Species Task Force, which includes among other agencies the National Oceanic and Atmospheric Administration, the U.S. Fish and Wildlife Service, the U.S. Geological Survey, and the EPA. This task force coordinates invasive species issues generally across the country. In addition, during the fall of 2009, 21 federal, state, and local agencies and other entities combined forces to form the **Asian Carp** Regional Coordinating Committee (the ACRCC), which is designed (as the name suggests) to track and to stop the migration of invasive carp. See generally **Asian Carp** Control, http://www.asiancarp.org/. The ACRCC counts as members those agencies that comprise the task force, the Corps and the District, the Coast Guard, the U.S. Department of Transportation, the White House Council on Environmental Quality, the Great Lakes Fishery Commission, the City of Chicago, and the state departments of natural resources of all of the plaintiff states, plus Illinois, Indiana, and New York.

In order to stop the invasive carp, the ACRCC has developed what it calls the "**Asian Carp** Control Strategy Framework," which is now in its third edition. The most recent document lists over 40 collaborative projects that the working group has designed to deal with invasive carp; many of these initiatives are underway or have been completed already. As the ACRCC describes it, the projects fall into eight categories:

> (1) targeted monitoring assessment activities above and below the electric barrier system, including enhanced monitoring above and below the barriers, electrofishing, and rapid response teams;
>
> (2) commercial harvesting and removal actions below the electric barriers (which involves fishing and removal of fish in the Lockport area, where the

CAWS connects to the Des Plaines River; creating new markets for the fish; and investigating certification requirements for invasive carp to be sold commercially);

(3) electric barrier actions and waterway separation measures (consisting of the construction of barriers between various waterways so that fish cannot move from one to the other during flooding; expedited construction of the now-completed third electric barrier; fish tagging to test the effectiveness of the barriers; and separation of various watersheds that pose risks);

(4) myriad studies on how best to separate the watersheds; the effectiveness of various measures; and risk modeling;

(5) research and technology development (including investigation of how fish move around the CAWS; food sources for invasive carp in the lakes and how those sources might be eliminated; the use of seismic technology to divert or kill invasive carp; attraction and repulsion pheromones of invasive carp; creation of toxin screens to kill fish; study of the weaknesses of carp to different toxins; physical barriers; reducing carp egg viability; and new detection methods, among other things);

(6) eDNA analysis and refinement (which involves monitoring and sampling for eDNA in the CAWS and increasing the effectiveness of eDNA testing);

(7) enforcement activities designed to prevent people from transferring carp between bodies of water; and

(8) work on funding, including the development of methods to pay for measures among the contributing groups.

In addition, the ACRCC has established three working groups: monitoring and rapid response; invasion control; and communication and outreach.

What we have described already reflects a substantial effort, but there is more. The Corps has been fulfilling the marching orders that it has received from Congress. In addition to the electric barriers and GLMRIS, which we have discussed in detail, we have mentioned the Corps's study of the effectiveness of its three electric barriers for stopping the movement of invasive carp through the CAWS. The final version of the Efficacy Study is due later this year, but there already have been four interim reports (numbered in typical bureaucratic fashion as Interim I, II, III, and IIIA), and the Corps has implemented measures pursuant to some of these reports. Interim I identified an area where the Des Plaines River and the Chicago Sanitary and Ship Canal are so close together that carp could wash between them during floods. (The plaintiffs had argued in their complaint that this area represented a huge problem.) The Corps has since built a fence to stop migration between these waterways, and that fence has already proven effective. Meanwhile, Interim II, which is not yet completed, will set operational parameters for the three electric barriers so that they can most effectively deter the movement of invasive species. The Corps says that even though this study is not finished, it now operates the barriers at the maximum safe strength. In connection with its Interim III report, the Corps consulted a panel of experts about a number of potential changes to its operation of the CAWS. The report concluded that additional screens should be installed on sluice gates, and the District responded by adding screens to two gates at O'Brien, which supplemented the two it had installed months earlier at the Controlling Works. In addition, Interim III recommended that the District cease using the sluice gate at Wilmette for diversion, and it hypothesized that the District might be able to create "atoxic zones" in the CAWS that would be so toxic that no fish would ever be able to swim through them. Finally, the Corps in Interim IIIA recommended the construction of an acoustic, air-bubble, and strobe-light curtain (more or less a disco screen), which would be designed to frighten fish back toward the Mississippi. The disco screen has not been started, but the Corps represented to us at oral argument that it intends to undertake the project at some location downstream of the existing electric barriers.

In addition to the measures outlined in the interim efficacy reports, the agencies continue to rely on traditional methods to monitor and kill invasive carp, including tracking, netting, electrofishing, and rotenone poisoning; and, as we have discussed, they have also continued eDNA testing throughout the CAWS. Where eDNA reveals a potential threat, the agencies have responded with days-long hunts for invasive carp. Continual fishing south of the CAWS reduces the propagule pressure that would otherwise push carp

closer to Lake Michigan. Finally, the Obama Administration has named an "**Asian carp** czar," who is charged with leading the administration's effort to stop invasive carp. Recently, the administration announced plans to install a high-intensity water cannon that would deter fish by firing huge, underwater blasts of water across Chicago Ship and Sanitary Canal.

It is our understanding that the defendants and the agencies we have just discussed are actively pursuing the measures that we have just described. In addition, where the defendants have represented that future steps will be taken—whether a disco screen, the water gun, operating the electric barriers at optimal settings, considering the possibility of block nets in the CAWS, completing and implementing GLMRIS in phases, continuing to monitor aggressively with traditional and eDNA techniques, or any of the other actions we have highlighted—we have no reason at this point to assume that this work will not be done. Whatever happens, the plaintiff states will continue to have a seat at the table as these and future plans are made and implemented. We conclude that on this record, there is nothing that any preliminary injunction from the court could add that would protect the Great Lakes from invasive carp while this suit is being adjudicated any better than the elaborate measures we have just described. This tips the balance of harms decisively in favor of the defendants.

VI

We take very seriously the threat posed by the invasive species of carp that have come to dominate parts of the Mississippi River basin and now stand at the border of one of the most precious freshwater ecosystems in the world. Any threat to the irreplaceable natural resources on which we all depend demands the most diligent attention of government. As the case proceeds, the district judge should bear in mind that the risk of harm here depends upon both the probability of the harm and the magnitude of the problem that would result. In the end, however, the question whether the federal courts can offer meaningful equitable relief—either preliminary or permanent—to help abate a public nuisance in the face of agency action is factual in nature. It depends on the actual measures that the agencies have implemented already and those that they have committed to put in place going forward. Our ruling today is tied to our understanding of the current state of play. We recognize that the facts on the ground (or in the water) could change. The agencies currently working hard to solve the carp problem might find themselves unable to continue, for budgetary reasons, because of policy changes in Washington, D.C., or for some other reason. If that happens, it is possible that the balance of equities would shift. Similarly, new evidence might come to light which would require more drastic action, up to and including closing locks on Lake Michigan for a period of time. If either situation comes to pass, then the district court would have the authority to revisit the question whether an exercise of its equitable powers is warranted, taking into account the principles we have discussed in this opinion. As things stand now, however, preliminary relief is not appropriate. The district court's judgment is AFFIRMED.

FN* This opinion was originally released in typescript on August 24, **2011**.

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