BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

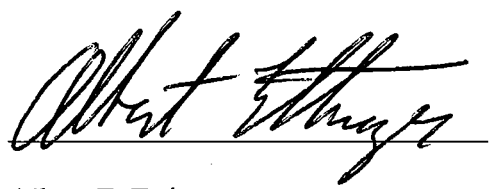
IN THE MATTER OF:	)	
	)	
PROPOSED AMENDMENTS TO	)	R2004-025
DISSOLVED OXYGEN STANDARD	)	Rulemaking – Public Water
35 ILL ADM. CODE 302.206	)	

NOTICE OF FILING

TO: See Attached Service List

PLEASE TAKE NOTICE that the Environmental Law and Policy Center of the Midwest ("ELPC"), Prairie Rivers Network and the Sierra Club today have electronically filed **Post-Hearing Comments of the Environmental Law & Policy Center, Prairie Rivers Network and Sierra Club**

Respectfully submitted,



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DATED: December 20, 2006

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Post-Hearing Comments of the Environmental Law & Policy Center, Prairie Rivers Network and Sierra Club

Two years of hearings, studies and informal discussions have shown that the current Illinois dissolved oxygen (DO) standard is too simple. The current DO standard of 35 Ill. Adm. Code 302.206, as applied by the Illinois Environmental Protection Agency (IEPA) in evaluating whether DO conditions are unhealthful to Illinois aquatic life, produces both false positives (i.e. it indicates DO problems where DO levels are healthy) and false negatives (indicates that DO levels are healthy where they are not).

Adoption by the Board of the proposal made jointly by the IEPA and the Illinois Department of Natural Resources (the "IEPA/IDNR Proposal"), if modified to take into account considerations regarding saturation levels presented during the hearing by Professor Thomas Murphy, would improve on the current standard by reducing the number of false positives without necessarily allowing dangerous conditions.

Adoption of the IEPA/IDNR Proposal, even with the improvements suggested by Professor Murphy, would not reduce the number of false negatives that are created by testing water bodies at sites or times when DO levels are not likely to be at their lowest. The testimony of numerous witnesses makes clear that to avoid often drawing the conclusion that a water body has healthy DO levels when it

does not actually maintain such levels, IEPA will have to follow rigorous monitoring practices and interpret the standard properly. Further, although the issue is not directly before the Board at this time, hearing testimony makes clear that proper protection of Illinois aquatic life requires changes to the way that IEPA writes permit limits for discharges of deoxygenating wastes.

Nonetheless, Prairie Rivers Network (PRN), Sierra Club and the Environmental Law and Policy Center (ELPC) urge the Board to adopt the IEPA/IDNR proposal with refinements regarding cold water conditions that were suggested by Professor Murphy.

I. If IEPA interprets and applies the standard properly, adoption of the IEPA/IDNR Proposal would not dangerously weaken the DO Standard during summer months.

As a practical matter, at issue is how much the Board is going to loosen the Illinois dissolved oxygen standard. The current DO standard provides that:

> Dissolved oxygen shall not be less than 6.0 mg/L during at least 16 hours of any 24 hour period, nor less than 5.0 mg/l at any time.

The proposal of the Illinois Association of Wastewater Agencies (IAWA) would leave the standard as it is for March through June. However, for the period of July through February, IAWA proposes to loosen that standard for all Illinois waters as follows:

> During the months of July through February, dissolved oxygen shall not be less than a one day minimum concentration of 3.5 mg/L, and a seven day mean minimum of 4.0 mg/L.

(Initial IAWA filing, Doc # 42201, p. 12).[1]

[1] The IAWA Proposal also has provisions defining averages and providing various monitoring requirements. However, nothing has been developed in the record as to how these provisions would be implemented by IEPA and it does not appear that they will be.

The IAWA has stated in testimony that it would accept an additional provision that the thirty (30) day average may not fall below 5.5 mg/L although IAWA's expert, Dr. James E. Garvey believes it has little biological support. (Garvey, Nov. 2-3, 2006 Tr. 90)

Like the IAWA Proposal, the IEPA/IDNR Proposal also will "pare down" the number of water bodies identified as having DO problems as explained by IEPA's Toby Frevert. (Frevert, Nov. 2-3, 2006, Tr. 32) The IEPA/IDNR Proposal also loosens the standard as to the period of August through February. As agreed by IAWA's Dennis Streicher and IEPA, the only element of the IEPA/IDNR Proposal that can be said to be tighter than the current standard relates to a small number of water segments that IEPA and IDNR have determined to be habitat for low oxygen sensitive species.(Frevert, Streicher, Nov. 2-3, 2006, Tr. 173-4, 208-09) It is "theoretically possible" for a water body designated as containing low oxygen sensitive species to violate the IEPA/IDNR Proposal standard and not the current standard if the water body violates the 6.25 mg/L seven day average provision during the March through July period without violating the 6.0 mg/l 16 hour average. (Frevert, Nov. 2-3, 2006, Tr. 210)

The significant issues, then, between the IAWA Proposal and the IEPA/IDNR Proposal are i) whether the current standard should be maintained for all waters during July, and ii) whether the current standard should be loosened as much as to waters that IEPA and IDNR have identified as providing habitat for oxygen sensitive species as it is for other waters.

A. The standard should continue to protect July spawning.

IEPA/IDNR science is based on a lot more data than the IAWA Proposal as to breeding periods for fish. IEPA and IDNR looked at species across the state and a broad range of species. (Ex. 23) They

concluded, as explained by IDNR's Steve Pescitelli, "there's lots of species that spawn after July 1." (Pescitelli, Nov. 2-3, 2006, Tr. 36)

On the other hand, the IAWA Proposal, a "one size fits all standard" as to the relevant water bodies, is based almost entirely on studies of fish in southern Illinois supplemented recently by one study of a backwater lake near Grafton. (Garvey, Nov. 2-3, 2006, Tr. 126) Further, IAWA argues that most fish complete most of their breeding before July without breaking down the larval periods for species (Garvey Nov. 2-3, 2006, Tr.177-78) or recognizing that the known late spawn may be important for species to compensate for high flow periods in spring. (Pescitelli, Nov. 2-3, 2006, Tr. 35-7)

IAWA also implicitly argues through various filings that the Board should loosen the standard during July because it would make it cheaper for Illinois dischargers to comply with the standard. This suggestion should be rejected because it is not supported by any economic data. (See Streicher, Aug. 25, 2005, Tr. 61) Indeed, for this argument to make sense there must be a number of dischargers that would face substantial costs to meet the current standard in July that they would not incur if they only had to meet the current standard in June and a 3.5 mg/L standard in July. It is particularly hard to imagine how this could be done given, first, that many dischargers are currently discharging to water bodies known to violate standards in June, a month that everyone agrees should continue to be governed by the 5 mg/L minimum and, second, that IEPA only very rarely uses the DO standard in permit writing. (Frevert, Nov. 2-3, 2006, Tr. 255-6) Still further, a standard that is not protective of

aquatic life cannot legally be approved by U.S. EPA under 33 U.S.C. 1313(c) on the basis of compliance cost considerations.[2]

B. The Board should adopt the IEPA/IDNR Position that Low DO sensitive species should be protected

IEPA/IDNR properly drew segment lines using available data as to the location of species requiring higher DO levels. The methodology for designating the water bodies having DO sensitive species was explained by IEPA's Frevert and IDNR's Joel Cross. (Frevert, Cross, Nov. 2-3, 2006, Tr. pp.29-31, 44, 214)

The IAWA's basic argument against giving this very modest level of extra protection to areas known to harbor species requiring more DO is to show that low DO levels have been found in these waters and argue that the aquatic life there must have adapted to the low DO levels. (See, Streicher, Nov. 2-3, 2006, Tr. 75). But the fact that low DO conditions have been found at a few sites in streams with DO sensitive fish does not mean that whole water body could be allowed to fall to that DO level without ecological damage. Most obviously, if the whole Fox River had hit the extremely low DO levels found by some monitoring stations in 2005 and 2006, there would have been no live fish in the

[2] The Board has stated that under Illinois law compliance costs are relevant to its consideration of water quality criteria. However, under federal law, economic factors may not be taken into account in setting the numeric standards that are protective of uses. Water quality criteria that protect the designated uses "must be based on a sound scientific rationale" and must protect the "most sensitive use." 40 C.F.R. 131.11(a); Economic factors are irrelevant to setting such criteria. Mississippi Commission on Natural Resources v. Costle, 625 F.2d 1269, 1277 (5th Cir. 1980). Fortunately, the situation has not been encountered in which the Board felt compelled by state law to adopt a standard that U.S. EPA would be required to reject under 33 U.S.C. §1313(c)(3), as that would require that U.S. EPA reject the Board adopted standard and publish a standard that complied with the Clean Water Act under 33 U.S.C. 1313(c)(4)(A).

river. (Garvey, Nov. 2-3, 2006, Tr.154-55) Plainly, at that time the fish in the affected segments found a place to swim. (Pescitelli and Garvey, Nov. 2-3, 2006, Tr. 34, 155)

Leibig's law of the minimum should not be twisted to imply that fish must be adapted to every environment, including unstable environments, in which they can be found. Species populations may be lost in particular areas and over time. A species that is plentiful one year may be scarce the next and a species may be harmed by assorted blows to its natural range occurring over a number of years.[3] It would not have been correct for a person in 1870 to look at the huge number of passenger pigeons still around and conclude that the bird had adapted to the European settlement of North America.[4] Similarly, the fact that DO sensitive fish are present in a water segment despite findings of low DO in some reaches of the segment for some period does not prove that the population is not already under some stress and would not be affected if the entire segment were hit with such low DO levels constantly or in combination with high flows, a series of droughts or other stressors. (See Frevert, Cross, and Pescitelli, Nov. 2-3, 2006, Tr. 30-4)

II. The Board should protect aquatic life against low winter DO saturation levels.

The logic of Dr. Murphy's testimony regarding the need to look at percentage saturation levels was not refuted during the hearings (See Murphy, Aug. 25, 2005, Tr. 88, 94; Garvey Nov. 2, 2006, Tr. 122), but it was claimed that his concerns should be rejected on the basis that it was impractical to use percentage saturation as part of the standard.

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[3] Wilson, E.O., The Diversity of Life, (Belknap Harvard Press 1992) pp. 234, 254.

[4] Of course, we now know that, while still huge, the population of passenger pigeons was crashing and that human activities would cause the bird to be extinct in 1914. Greenberg, Joel, A Natural History of the Chicago Region, (U. of Chicago Press, 2002) pp. 348-49.

The practical problems of considering percentage saturation can be overcome by using technology no more complex than a thermometer. To ensure sufficient DO saturation during periods of cold temperature, the IEPA/IDNR Proposal should be revised to include a minimum DO level of 6.5 mg/L when water temperature is 10 degrees centigrade or below.

At the November 2006 hearing, Dr. Cynthia Skrukrud of the Sierra Club recommended the IEPA/IDNR Proposal be revised to set this minimum DO level for all waters during the winter months. However, given concerns raised at the hearing that basing this additional requirement on time of year was too broad, Sierra Club, PRN and ELPC now offer a revised recommendation to be based on the water temperature.[5] In his testimony, Dr. Murphy also indicated that such a requirement would address the need to ensure sufficient DO saturation during periods of cold temperature. (See Murphy, Skrukrud, Nov. 2-3, 2006, Tr. 53, 256)

III. Proper interpretation of the standard is needed.

ELPC, PRN and the Sierra Club believe that the IEPA/IDNR proposed rules are capable of being interpreted in a way that is protective of Illinois aquatic life. We wish, however, to register our concern that a number of the terms in the proposed rules, such as "quiescent", "lake" and "isolated" are sufficiently vague that they are capable of being interpreted in a way that would not be protective. Certainly, it would be intolerable if major stretches of rivers with dams, such as the Illinois River, the Du Page River or the Fox River, were allowed to have DO levels that are below that necessary to support a balanced aquatic environment.

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[5] Particularly given the testimony of IAWA's Michael Callahan and Dennis Streicher that discharge from a sewage treatment plant raises ambient water temperatures in the winter (Callahan, Streicher, Aug. 12, 2004, Tr. 106-07), it is clear that making the adjustment proposed by Professor Murphy is unlikely to affect many streams or dischargers.

IV. Implementation procedures remain to be developed and steps must be taken to improve IEPA permitting of the discharge of deoxygenating wastes.

Issues of measurement and implementation have not been worked out. The IAWA apparently believes that IEPA will develop implementation rules to require continuous monitoring and monitoring that utilizes certain safeguards, but IEPA has not agreed to such monitoring as a general rule and has objected to IAWA's view of what rules will be developed as a result of a change in the DO standard. (See June 29, 2004 Tr. 118, 144, 200; November 2-3, 2006, Tr. 213). IEPA has not generally committed to doing pre-dawn monitoring (Frevert, Nov. 2-3, 2006, Tr. 17) although the experts and the data clearly show that pre-dawn DO levels need to be measured. (Garvey, Aug. 12, 2004, Tr. 79, Nov. 2-3, 2006, Tr. 111) Because neither the IAWA nor IEPA/IDNR Proposals set forth the required monitoring regime, the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) cannot fully support either proposal. (Kollias, Nov. 2-3, 2006, Tr. 242)

Environmentalists will oppose removing water bodies from the TMDL list based on the new standards unless new data shows that the water body is actually meeting the new standards as the new standards are implemented properly. For example, August data showing that the water body never fell below a DO level of 4.9 mg/L would not show that the water body has adequate DO levels if the samples were taken during daylight hours. Dr. Garvey made clear that nighttime DO levels might easily drop 3 mg/L and that in impaired streams DO might fluctuate as much as 6 or 7 mg/L and that in some waters algae and aquatic plants might cause fluctuation ever greater. (Garvey, Aug. 12, 2004, Tr. 79, Aug. 25, 2005, Tr. 65). The Fox River data produced by the IAWA shows huge DO swings. (Garvey, Nov. 2-3, 2006 Tr. 110-11) Indeed, a daytime reading of 4.9 mg/L in a water body known to be

affected by nutrient pollution would be virtual proof that the DO was being violated severely during early morning hours.[6]

It appears that sewage treatment plants are having a major effect on DO levels. The data on flow/DO relationship shows DO levels sink as effluent makes up a larger part of the flow in low gradient steams. (Garvey Nov. 2, 2006 Tr.112, 149) The testimony of Richard Lanyon, General Superintendent of the MWRDGC, supports this testifying that DO cannot be maintained in slow moving streams taking a lot of effluent (e.g. the lower Des Plaines). (Lanyon, Nov. 2-3, 2006, Tr. 220-21, 232-33)

Finally, the record in this proceeding shows the need to reconsider IEPA's reliance on the Deoxygenating Waste rule, 35 Ill. Adm. Code 304.120, as almost the sole basis for setting limits on discharges of biological oxygen demanding pollutants. Under this rule, IEPA is currently granting permits for the discharge of such wastes under conditions in which the discharge will cause dissolved oxygen levels to fall below the 5.0 mg/L specified by 35 Ill. Adm. Code 302.206.

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[6] Although the cause of low DO levels is basically irrelevant to this proceeding (Garvey, Nov. 2-3, 2006, Tr.136), it is suggested in Dr. Garvey's October 2006 pre-filed testimony that nutrient levels are not the cause of DO problems. Actually, the conclusion of the David studies cited by Dr. Garvey is that, given the high levels of nutrients in certain east Illinois streams heavily affected by agriculture, differences in nutrient levels within the ranges present in those streams did not explain DO levels and that in such water bodies "it might not be possible to reduce nutrient concentrations sufficiently to limit filamentous algal blooms." (Exhibit 2 to Hearing Exhibit 30) Given Leibig's law of the minimum and the fact that nutrients are necessary for growth of periphyton and macrophytes, Dodds, W.K., Freshwater Ecology, (Academic Press, 2002) pp. 321-26, nutrients certainly have a dramatic impact on Illinois waters as shown by the massive diurnal variation in certain Illinois waters. Contrary to the understanding of Dr. Garvey, nutrient pollution is not now controlled by the Clean Water Act because nutrients from farms and sewage treatment plants are not now generally subject to permit limits. Indeed, a David paper, published in 2000, indicates that nitrogen levels have continued to rise to the present and phosphorus levels only stabilized in the 1990s. (Hearing Ex. 38)

In pre-filed testimony, Richard Lanyon testified that:

> Approximately 70 percent of the annual flow leaving the [Chicago area waterways] at Lockport consists of treated water reclamation plant effluent. Effluent also contains biological oxygen demand (BOD) and suspended solids (SS) at concentrations less than 5 mg/L. Therefore, the oxygen standard demanding substances in the effluent easily consume the available oxygen in the effluent, making it difficult for effluent alone to provide sufficient oxygen to maintain compliance with the DO water quality standard. (Lanyon, Nov. 2-3, 2006, Tr. 220-21)).

Mr. Lanyon confirmed and further explained these facts in his oral testimony given November 3, 2006, stating that, where the receiving water is slow moving and the water has a high level of effluent, discharges at the level of 5 mg/L BOD5 can cause DO concentrations to fall below 5 mg/L. As General Superintendent Lanyon said, "that's the nature of the science." (Lanyon, Nov. 2-3, 2006, Tr. 233)

Under the Illinois deoxygenating waste rule, 35 Ill. Adm. Code 304.120, the tightest limit that Illinois EPA requires in NPDES permits is *10 mg/L CBOD5*. Because total BOD includes NBOD as well as CBOD, the lowest level required in permits by the Illinois rule then is over twice the level that Mr. Lanyon stated could cause violations.

During the dissolved oxygen hearing, Illinois EPA's Toby Frevert testified that the Illinois dissolved oxygen water quality standard was only rarely, if ever, used to set permit limits because the agency uses its deoxygenating waste rule to establish permit limits. (Frevert, Nov. 2-3, 2006, Transcript pp. 18, 255-56) Further, we learned during the hearing that the Fox River and certain other Illinois waters that receive high levels of sewerage discharges experience extremely low DO levels. No wonder; that's the nature of the science.

IEPA should not continue to issue NPDES permits that allow discharges that may cause or contribute to violations of state quality standards. Other states use well-established models to determine the maximum amount of deoxygenating wastes that may be discharged without causing violations of dissolved oxygen standards. This should be done in Illinois.

CONCLUSION

The Board should adopt the proposed standard proposed by IEPA and IDNR but should also provide that waters should not fall below 6.5 mg/L of DO if water temperatures are below 10 degrees centigrade.

Respectfully submitted,

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DATED: December 20, 2006

CERTIFICATE OF SERVICE

I, Albert Ettinger, being duly sworn on oath, certify that I caused a copy of the above Notice and attached **Post-Hearing Comments of the Environmental Law & Policy Center, Prairie Rivers Network and Sierra Club** to be sent via first-class U.S. Mail to the individuals identified on the attached service list, at their address as shown, with proper postage prepaid, on this day, December 20, 2006.

Respectfully submitted,

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DATED: December 20, 2006

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