BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PROPOSED AMENDMENTS TO	)	**R 04-25**
DISSOLVED OXYGEN STANDARD	)	
35 Ill. Adm. Code 302.206	)	

NOTICE OF FILING

TO: See Attached Service List

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Pollution Control Board the following documents:

WRITTEN TESTIMONY OF DENNIS STREICHER; and

WRITTEN TESTIMONY OF DR. JAMES E. GARVEY FISHERIES AND ILLINOIS AQUACULTURE CENTER SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, ILLINOIS

a copy of which is served upon you.

ILLINOIS ASSOCIATION OF WASTEWATER AGENCIES,

By: _____
One of Its Attorneys

Dated: August 4, 2005

Roy M. Harsch
Sheila H. Deely
GARDNER CARTON & DOUGLAS LLP
191 Wacker Drive – Suite 3700
Chicago, Illinois 60606
(312) 569-1000

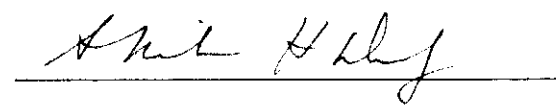
CERTIFICATE OF SERVICE

The undersigned certifies that a copy of the foregoing:

WRITTEN TESTIMONY OF DENNIS STREICHER; and

WRITTEN TESTIMONY OF DR. JAMES E. GARVEY FISHERIES AND ILLINOIS AQUACULTURE CENTER SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, ILLINOIS

was filed by hand delivery with the Clerk of the Illinois Pollution Control Board and served upon the parties to whom said Notice is directed by first class mail, postage prepaid, by depositing in the U.S. Mail at 191 North Wacker Drive, Chicago, IL on Thursday, August 4, 2005.



Service List

R 04-25

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WRITTEN TESTIMONY OF DENNIS STREICHER

I would like to thank the Illinois Pollution Control Board ("Board") again for hearing my testimony. My name is Dennis Streicher. I'm Director of Water and Wastewater with the City of Elmhurst, Illinois. I've been employed by the City of Elmhurst since 1972. For the last 20 years I have managed the wastewater plant, the public water supply and the storm water system in Elmhurst. I hold an Illinois EPA Class 1 Operators license and an Illinois EPA Class A Potable Water Operators license.

Given the length of time since the first two hearings, I will again explain that I am the President of the Illinois Association of Wastewater Agencies ("IAWA"). The IAWA is a professional association representing the major wastewater treatment plants in the state of Illinois. The IAWA has over 100 agency and affiliate members, which include approximately 55 sanitary districts and municipalities throughout the state. These agencies operate dozens of publicly owned treatment works ("POTWs"). The representatives of these organizations are public officials and include both elected and appointed trustees of districts and appointed officials at

municipalities throughout the state. In addition to the POTWs, water reclamation districts and municipalities, the largest Illinois private wastewater treatment utility that owns and operates 12 plants is also a member. Our constituents are the citizens and taxpayers of Illinois and are the same constituents as any other state or public agency.

During the second hearing of this petition Board member Andrea Moore repeated a comment made by Toby Frevert of the Illinois Environmental Protection Agency ("IEPA") as describing this petition as one of the most important decisions this board will ever make. That description has been continually on my mind as I directed my efforts over the last year to meet with various stakeholders to explain and defend the IAWA petition. I had originally hoped to convince others that the Garvey/Whiles model for an appropriate dissolved oxygen standard was the correct one and return to the Board with an agreement. Unfortunately that hasn't happened.

I think the primary reason for that is based on perceptions. There is a perception that this petition is an attempt to somehow reduce water quality protection. One person who has taken a public and vocal position opposed to the petition is Dr. David Horn who has led a letter writing petition to the Board. His form letter was distributed to a number of folks along the Fox River and is the source for many of the Public Comments posted on the Board web site. Dr. Horn expressed a concern about the IAWA motivations in this matter. He was suspicious that the petition is

an effort to "roll back" an important environmental protection. His perception is that the wastewater industry is a polluting industry that should have more strict controls and is no different than any commercial enterprise.

It's a perception that I think is shared by a lot of folks, it's a perception that I, as President of IAWA and as a career long wastewater professional, have tried to reverse. Wastewater plants in Illinois are, for the most part, publicly owned and operated. The owners of those plants have no profit motive; we have no interest in circumventing or avoiding appropriate and well constructed environmental regulations. But at the same time the managers of the wastewater treatment facilities, being professionals, and generally being engineers as well, want to be convinced that the regulations that are being promulgated will be both cost effective and helpful in protecting our water environment.

As I spoke to Dr. Horn I tried to make that point clear. I also tried to make clear that the current dissolve oxygen standard has little or no scientific basis to it. Much of the current data show water bodies with robust biotic indexes violating the current DO standard. The current standard is unrealistic and too high even for rivers deemed as high quality rivers. His response was similar to that of many other folks. He saw no reason why the water quality standard we use should not be over protective. In other words that it be made intentionally high to insure adequate dissolved oxygen levels in the rivers and lakes in Illinois. He

felt that it was good that there be a margin of safety built into the regulation and that the margin remain.

I agree that when constructing a regulation that a margin of safety be incorporated into the calculation. I also believe that the margin of safety be identified and be on the table, so to speak, with all other details of the proposed regulation. The Garvey/Whiles report had included a margin of safety deemed to be appropriate and conservative enough to be protective of the water quality. I believe that is the proper way to formulate a water quality standard.

After the second hearing about a year ago the IAWA asked for time to meet with various stakeholders including the Illinois Department of Natural Resources ("IDNR")and the IEPA to further explain the data supporting the IAWA petition and to hear evidence and review any data available that would not support the petition. We also discussed how the proposed new standard might be implemented. I'd like to thank IEPA for their facilities for these meetings over the last 12 months. I would also like to thank Dr. Garvey who spent many hours of his time pouring over data and studies from many sources and in separate discussions with IDNR and IEPA representatives to further explain and support the original Garvey/Whiles study. Other interested stakeholders included the Prairie Rivers Network, Sierra Club, United States Environmental Protection Agency and from time to time interested parties including representatives from municipalities within the state and the Illinois Environmental

Regulatory Group. I believe that all of the persons at the table understood the importance of this standard and had a very great deal of concern to get it right.

Initially many of the participants expressed concerns about what they perceived to be a 'roll back' of a critical water quality standard. They felt that the existing standard was 'safe' and provided extra protection. These were the same concerns expressed to me months earlier by David Horn about the Fox River. As discussions progressed and new data was available and reviewed it became increasing apparent that the Garvey/Whiles study was a very good fit but my feeling was that many participants were still uneasy. In an effort to keep the discussion going the representatives from IAWA listened closely to a number of alternatives that were proposed. All of these alternatives were intended to add a level of comfort to the concerns expressed by participants opposed to the petition. Often we got into what I would call negotiations over details in the petition. I for one am very uncomfortable negotiating facts or well defined and reviewed data. I have the opinion that good science should not be negotiated. It simply is what it is. But in an effort to allow for any idea to be presented and discussed compromises were offered. Modifications to the petition were discussed, options and adjustments were proposed in an effort to mitigate the concerns of some and maintain the integrity of the petition and the science supporting it. In the end none of the concerns expressed by the participants could be substantiated. The

initial data withstood all arguments. To compromise would deny the accuracy of the data. During the entire year, the results of more continuous monitoring studies were presented, all of them supporting the Garvey/Whiles report as published in March of 2004. Dr. Garvey will present testimony detailing those new studies completed over the past year that add additional evidence supporting the IAWA petition as originally filed.

Apparently, some at the IDNR are still uncomfortable with the petition as filed. They will propose some forty rivers and stream segments be exempted and maintain the existing DO standard. The criteria for choosing the list is rivers and stream segments that have dissolved oxygen sensitive species present. But there is a contradiction in their logic. Many of the rivers chosen for keeping the existing standard violate that very standard! Yet they were chosen because they support the very species of DO sensitive fish that are a cause of concern. How can this be? How can the sensitive species be present in rivers that are violating the existing standard? It's our opinion that the answer is simple the existing standard is incorrect. Rivers and stream segments fit the Garvey/Whiles model for DO concentrations and support the DO sensitive species.

The IAWA would once again like to reiterate its commitment to using the best science and available data to promulgate well founded and

effective regulations. For that reason we are returning to the Board with only minor adjustments to the original petition.

The dissolved oxygen water quality standard is a key measure that will have a great deal of influence over the development of other water quality standards that are about to be or in the process of being promulgated. Today many streams are being labeled as DO impaired when they are not in fact impaired. Those impairments are adding to the states 305(b) and 303(d) lists. Many TMDL reports both published and under development are including unnecessary DO violations adding to the perceived mitigation efforts necessary to restore the rivers. The Northeastern Illinois Planning Commission published its Water Quality Management Plan, which included DO impairments as a violation to water quality standards. Last May the City of Elmhurst was issued a new NPDES operating permit for the City's wastewater plant. The first draft of that permit included a dissolved oxygen limit of 6.0 mg/L. I argued that the limit was unnecessary and was successful in changing the Elmhurst permit to require monitoring and reporting only. Many POTWs across the state however are having a continuous DO limit of 6.0 mg/L imposed that is likely unnecessary and will add to their costs for operations and maintenance as a consequence. In short the current incorrect dissolved oxygen water quality standard is already resulting in very large sums of money being spent to address a problem that likely does not exist.

I think that the stakeholder meetings had one important consequence. The IEPA and the IDNR agree that the current dissolved oxygen standard is flawed. Getting the standard correct is important. It is especially important to have a dissolved oxygen standard that is supported by the best science. The IAWA proposal in this matter follows the National Criteria Document design, it is based on the best science available. In previous testimony and throughout the stakeholder meetings the IAWA has agreed to modify the petition to incorporate the Chapman 30 day average to come into closer alignment with the National Criteria Document. In addition the IAWA would be further willing to modify the petition to incorporate a 'day time' minima of not less than 5.0 mg/L if others so desire and the Board agrees. This minimum would be measured during daylight hours and must be met for at least 6 hours. Some stakeholders saw this level as adding increased protection for water quality. The IAWA is not filing the petition to decrease protection for waters in need of attention for improvements. Our feeling is that if a river or stream cannot meet such a 5.0 mg/L DO concentration it probably does need additional regulatory protection.

The IAWA is Illinois' front line water quality protector. The association has endeavored to work closely with the IEPA and others to develop sound environmental policies. As an example I'd like to quickly describe a new initiative that the IAWA has begun. With IEPA participation the IAWA is using funds generated from dues paying

members to retain consultants to begin the long process of defining use designations for Illinois rivers and streams. This effort will we hope eventually establish categories of realistic attainable uses for the states waters. The Clean Water Act suggested that states establish such a list because as Toby Frevert has said, "...all rivers are not created equal". Realistic and attainable uses will help the IEPA craft appropriate regulations and the IAWA plan for future water treatment needs.

The IAWA and the managers and engineers that operate publicly owned facilities want to have an effective set of regulations that will make best use of the facilities and the resources that the sanitary districts and the municipalities must spend toward plant construction and operation. I am sure you will hear suggestions for compromises. Please consider that the reason for a compromise is to address concerns and doubts not evidence supported by fact.

Thank you very much for hearing this petition.

CH02/ 22399094.1

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WRITTEN TESTIMONY OF DR. JAMES E. GARVEY
FISHERIES AND ILLINOIS AQUACULTURE CENTER
SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, ILLINOIS

Introduction

I thank the Illinois Pollution Control Board for hearing my testimony at this third hearing on the Illinois Association of Wastewater Agencies (IAWA) proposal to amend the dissolved oxygen water quality standard. As you know, my name is Dr. James E. Garvey. I currently serve as an Associate Professor in the Department of Zoology and as the Assistant Director of the Fisheries and Illinois Aquaculture Center at Southern Illinois University Carbondale (SIUC). I also have been recently elected as an officer in the Illinois Chapter of the American Fisheries Society. I have worked in the Midwest and Central U.S. for the duration of my professional career and have experience in both regional lakes and streams. I am author of more than thirty peer-reviewed publications in aquatic ecology, with over 400 published papers citing my research findings to date. Two years ago, IAWA contracted Dr. Matt Whiles, another Associate Professor working in aquatic ecology, and me to assess the current literature on dissolved oxygen effects on freshwater systems. We also critiqued the current Illinois state dissolved oxygen standard which requires that at no time shall concentrations decline below 5 mg/L and for at least 16 hours each day they must remain above 6 mg/L. As I have noted in previous testimony to the Board, we concluded in our report that this standard is unrealistic for

most streams in the state, because oxygen concentrations fluctuate both seasonally and daily, often declining below the state standards. These conclusions were based largely on published studies summarizing research conducted outside of Illinois and further bolstered by unpublished continuous monitoring data collected by the United States Geological Survey (USGS) in eight Illinois streams. These findings were discussed extensively during previous hearings. Since then, I have reviewed a document generated by Ohio EPA (1996) that also concluded that a minimum of 6 mg/L for even the highest quality streams in that state was unrealistic (Exhibit 1).

Proposed Recommendations

Since the last hearing in summer 2004, our recommendations originally made to the Board still stand, although I will outline a few potential modifications later. The recommendations as to how to amend the existing Illinois dissolved oxygen standard rely heavily on the guidance of the 1986 USEPA National Criteria Document for dissolved oxygen. Because of the passage of time since the IAWA proposal was first filed and the initial two hearings, I will repeat what our initial recommendations were here. Dr. Whiles and I recommended that during March 1 through June 30, when early life stages of sensitive species are present and freshwater has the capacity to hold high oxygen concentrations, a minimum identical to the current Illinois standard of 5 mg/L and a seven-day mean of 6 mg/L should be adopted. This is similar to the year-round standard for exceptional-designated waters in Ohio. During warm, productive months and the remainder of the year when species with sensitive early life stages have largely completed reproduction, we recommended a minimum of 3.5 mg/L and a seven-day

mean minimum of 4 mg/L. It is important to emphasize that we included running means to avoid chronically low dissolved oxygen concentrations. We set this standard acknowledging that dissolved oxygen concentrations in undisturbed freshwaters decline during warm months due to water's reduced capacity for oxygen and increased biological production. For the proposed standard to be supported, minima must not be violated, ensuring that concentrations never approach critically lethal limits. These regulatory values are consistent with, and with respect to the 3.5 minimum value more restrictive than, the 1986 USEPA Criteria Document values.

Summary of Stakeholder Meetings

Following the second hearing there have been a series of stakeholder meetings beginning in the fall 2004 through the spring 2005. I participated in all of the meetings among representatives of IAWA, state and federal agencies, and advocacy groups to discuss the proposed standard. As was agreed to at these meetings, I also discussed issues that were presented at the meeting at greater length and detail with several agency personnel through telephone conversations. Many of these productive conversations were with Scott Stuewe, Acting Chief of Fisheries in the Illinois Department of Natural Resources (IDNR). As our meetings progressed, more data were provided for streams in the Midwest, primarily in Illinois. In addition, the data for the eight continuously monitored streams discussed during the last hearing were refined, summarized, and published in a 2005 USGS report (Exhibit 2). Analysis of these data by Paul Terrio of the USGS by request of the group largely mirrored my previously discussed analysis (Exhibit 3). The Garvey and Whiles proposed dissolved oxygen standard "works".

Relative to the current standard or other proposed standards, it greatly reduces the percentage of violations of streams with high biological integrity but still correctly identifies degraded systems.

30-day mean and continuous data

The stakeholder group agreed to support the adoption of the non-spring, 30-d mean of 5.5 mg/L advocated by the 1986 National Criteria Document. It is important to note that the proposed 30-d mean generated many (23%) violations in a high-quality Illinois stream, Lusk Creek. Thus, addition of this standard may generate unmerited violations.

Ohio data

A report entitled "Notes on the association between dissolved oxygen and fish and macroinvertebrate assemblages in wadeable Ohio streams" generated by Edward Rankin of the Center for Applied Bioassessment and Biocriteria in Ohio emerged during our deliberations as the result of input from USEPA (Exhibit 4). This extensive survey of both dissolved oxygen grab samples and continuous sonde data in Ohio streams shows the pronounced lack of correlation between dissolved oxygen concentration and biological integrity as quantified for fishes or macroinvertebrates. Minimum dissolved oxygen concentrations in streams with very high integrity values occasionally declined below 4 mg/L but very rarely below 3 mg/L. Thus, warmwater streams that are considered to be of high biological integrity in Ohio would be in violation of the current Illinois standard but probably not the Garvey and Whiles proposed standard.

Stream list

Some streams in Illinois might have naturally occurring, continuously high dissolved oxygen concentrations, even during summer. Most likely this would occur in streams with a cold-water source and a high gradient. The IDNR, largely through the efforts of Scott Stuewe and his biologists, generated criteria by which certain streams would continue to fall under the current dissolved oxygen standard in the state. The primary justification for this listing would be that the streams are perennial, containing either four (tributaries) or five (mainstems) fish species deemed dissolved-oxygen sensitive by state biologists. I am unsure of the tolerance of many of these species to low oxygen, although all are associated with streams of very high water quality and intact physical structure. Thirty mainstem tributaries and ten mainstem river reaches fell within the IDNR's recommended categorization scheme. Of these, IEPA has noted that about thirty segments within these streams are currently listed for Aquatic Life Use impairment due to low dissolved oxygen. Thus, although the current listing likely does afford protection to many stream segments requiring higher oxygen concentrations, the presence of dissolved oxygen sensitive species in some streams with documented low dissolved oxygen concentrations presents obvious concerns about the biological realism and efficacy of this list.

Spawning timing

An issue that continues to remain unresolved among participants of the stakeholder group is the exact duration of the "spring" period where the higher standard

of a 5 mg/L minimum and 6 mg/L mean hold. Given that reproduction of most stream organisms is driven by spring temperatures, latitudinal differences in spring warming in Illinois might influence when sensitive early life stages are present. I used minimum daily temperature data from the USGS continuous monitoring effort (Exhibit 2) to determine how temperature available for spawning fish differed between northern and southern streams (Exhibit 5). I acquired spawning temperatures of many Illinois fishes from the literature and determined how differences in warming would affect spawning times. By June 30th, most fishes in southern Illinois likely have completed spawning. In the northern half of the state, most spawning may not be initiated until late June. Spawning in the central portion of the state likely occurs during mid June. Indeed, unpublished larval fish spawning data generated by one of my students in the Illinois and Mississippi Rivers near central Illinois confirm that most spawning is completed by mid June (Exhibit 6). Research that I published in the Transactions of the American Fisheries Society on three lakes across eight years showed that most production of larval gizzard shad and bluegill occurred before July in central Ohio reservoirs (Exhibit 7).

Some species, most notably the sunfishes here in Illinois, spawn through the summer. This concern led several biologists within the state agencies to recommend that the "spring" designation be extended through late summer when dissolved oxygen concentrations are expected to decline naturally. In previous testimony, I argued that many of these species must be able to tolerate occasionally low dissolved oxygen or they would not persist in nature. The fact that streams in violation of the current standard are listed as containing sensitive species by IDNR supports this suggestion. Many of Illinois fish species spawn during both proposed "seasons" in the Garvey and Whiles report. For

the stakeholders, I conducted an exercise to show why offspring produced early (i.e., before June 30) would likely contribute disproportionately to fish production (Exhibit 8). This is largely based on the peer-reviewed literature that demonstrates that the earliest spawned fish in an annual cohort likely have the highest survival. A paper I published in the Canadian Journal of Fisheries and Aquatic Sciences shows that, although young bluegill present during fall represented a range of daily ages and sizes, only the oldest and largest individuals survived to spring (Exhibit 9). This pattern obviously has exceptions, but it does appear to hold generally among species. Thus, commercially and recreationally important species such as sunfish and channel catfish that spawn beyond the proposed June 30 "spring" date are still protected from occasionally declining oxygen after this date. Early spawned progeny, on average, will contribute disproportionately to their populations.

My conclusion is that the June 30 cutoff for the south and perhaps July 15 for the north is sufficient to provide protection for most fishes spawning in the state.

Conclusions

Given the stakeholder discussions and further analysis, based upon the exhibits I cite in this testimony, I conclude that the standards originally proposed in the Garvey and Whiles report to IAWA are sound. This is further supported by the favorable review of our report by the author of the National Criteria Document, Gary Chapman. I summarized his comments in previous testimony to the Board. Addition of a 30-d mean and perhaps latitude-dependent dates may provide some additional comfort to various stakeholders, although the biological relevance is still somewhat unclear. I conclude this

prepared testimony by again reiterating that the primary factor affecting biotic integrity in streams is the physical template. And the best method for monitoring integrity is through the assessment of the resident organisms. Although laboratory data show a strong effect of very low dissolved oxygen concentrations (typically much less than 3 mg/L) on individual aquatic organisms, the data presented herein demonstrate unequivocally that oxygen typically occurring in natural streams (i.e., above 3 mg/L) explains very little of the variation in biological integrity. Thus, in my view, the goal of resource agencies should be to maintain oxygen concentrations above the proposed seasonal minima and focus their resources on improving the likely culprit affecting variance in integrity among warmwater streams - physical habitat.