

ILLINOIS POLLUTION CONTROL BOARD  
August 18, 1982

In the Matter of: )  
)  
AMENDMENTS TO CHAPTER 3: ) R77-12  
WATER POLLUTION (Effluent ) Docket D  
Disinfection) )

DISSENTING OPINION (by J.D. Dumelle):

My reason for dissenting in this matter is my concern that swimmers and water skiers on the major rivers of Illinois will become ill with gastroenteritis or shigellosis (dysentery).

The majority opinion (pp.9-11) seems to indicate that fecal coliform standards which are used to measure contamination at beaches and in swimming pools are not the best measure.

Let's look at the record on the question of adequacy of fecal coliform water standards. The following county or city health agencies are on record supporting the use of fecal coliform standards:

Peoria City/County Health Department			
Tazewell County	"	"	"
Grundy	"	"	"
McHenry	"	"	"
Lake	"	"	"
City of Chicago	"	"	"
Suburban Cook County--Du Page County Health Services Agency			

In addition, the Woodford County Board (which may not have a health department) is on record against dropping disinfection. The 1980 census populations for the jurisdictions listed above are as follows: Peoria County (200,466); Tazewell County (132,078); Grundy County (30,582); McHenry County (147,724); Lake County (440,372); City of Chicago (3,005,072); Suburban Cook County (2,248,118); Du Page County (658,177); and Woodford County (33,320). They total to 6,895,849 or 60.4% of the 1980 population of Illinois of 11,418,461. Can those many professional health departments, many of which are headed by medical doctors or holders of the Master's in Public Health degree, all be wrong on such an important matter?

I think not. And I think the Pollution Control Board should have given much more weight and credence to the professional opinion of these health agencies representing 60.4% of Illinois citizens.

Fecal coliforms are used by the Illinois Department of Public Health as a measure of swimming pool safety. A count of one, repeat one, is sufficient to close a swimming pool. Does the Board feel that IDPH should not use fecal coliforms to test for swimming pool safety? On p.10 (bottom) of the majority opinion the Board points out that shigella (which causes dysentery) or pathogenic viruses have not been used for swimming health standards.

Thus, it seems to me, the fecal coliform standard is still the best one to use and must be used until something far better is developed and accepted.

The economic impact study (EcIS) done by Huff and Huff, Inc. was a major factor in the majority's decision. Mrs. Linda Huff, the principal witness, is a chemical engineer with an MBA degree. She is not a microbiologist or an MPH or a physician by training. She arrived at her conclusions by devising a shigella standard. (Bloomington hearing, July 17, 1981, R.113-115).

The majority in its opinion (bottom of p.10) rightly rejects shigella as a measure of water quality for protection of swimmers. Should not Mrs. Huff's opinion as to the public health safety of dropping disinfection also have been rejected?

How valid is the 500 fecal coliforms per 100 milliliters used now by the City of Chicago to close beaches? That number represents a partial loosening of the 200 fecal coliforms per 100 milliliters water quality standard set by this Board in 1972. The 200 figure apparently was originally derived from the Albert H. Stevenson report titled "Studies of Bathing Water Quality and Health" published in May 1953 in the American Journal of Public Health. If one goes through that report and rearranges the data in Table 5 (p.537) the following correlation appears (note: total coliforms are assumed to be 10 times fecal coliforms):

Fecal Coliforms per 100 ml.	Three-Day Illness Rate per 100 swimmers
3	8.7
4	8.5
73	9.9
230	12.2

To me, this shows a positive correlation between fecal coliforms and illness to swimmers. If the fecal coliform standard is now thought to be inadequate then a better standard ought to be devised.

The Board had before it in this record an estimate of fecal coliform levels that would occur along the Illinois River if disinfection at sewage plants were dropped as is now to be done. Compare these predicted levels (second column) with the present level for closing Chicago beaches on Lake Michigan (500 fecal coliforms per 100 milliliters).

	Predicted Fecal Coliforms/100 ml.	Ratio to Chicago Standard
Morris	28,700	57.4
Marseilles	17,400	34.8
Ottawa	12,300	24.6
La Salle-Peru	6,880	12.8
Hennepin	2,992	6.0
Lacon	1,370	2.7
Peoria	534	1.1

Thus it is predicted by using generally accepted die-off equations that the William G. Stratton State Park at Morris (a major waterskiing center) will have fecal coliform levels in the Illinois River which are 57.4 times the level at which Chicago beaches are now closed! Does this not give one pause?

The predicted fecal coliform densities above come from Table 4, p.31, of the report dated December 14, 1981 done by Dr. Charles N. Haas. Dr. Haas is a graduate microbiologist and an assistant professor of environmental engineering at Illinois Institute of Technology.

Persons who swim (and I include water skiers in this category) are most likely to contract gastroenteritis from polluted water. This illness has "Montezuma's Revenge" symptoms of diarrhea, etc. Since it is not an illness required to be reported by physicians, an increase in its incidence will probably go undetected. A water skier at the William G. Stratton State Park might get ill a few days later and perhaps not even connect it to the earlier polluted water exposure.

Much more serious is shigellosis (dysentery). A study in this record titled "Shigellosis From Swimming" appeared in the Journal of the American Medical Association in October 1976. Two of the authors are medical doctors: Dr. Mark L. Rosenberg and Dr. Kenneth K. Hazlet. Of the 45 cases of shigellosis contracted in this outbreak, 32 were traced to swimming in the Mississippi River 5 miles below a sewage treatment plant which was not disinfecting. The fecal coliform level was 17,500 per 100 ml in this case study. The predicted levels by Dr. Haas given above show that fecal coliform levels at Morris will be 28,700 and at Marseilles, 17,400. The symptoms experienced in the Dubuque, Iowa outbreak included diarrhea (100%), fever (80%), abdominal pain (80%), chills (55%), headache (55%), nausea (51%), vomiting (49%), and bloody diarrhea (24%). Two children "who had played together at the river's edge" 20 miles below the sewage plant also got ill with shigellosis (p.1850).

Under the regulation adopted today, sewage plants will be able to discharge untreated wastes to the major rivers of Illinois. A letter in this record from Dr. David Kenney, Director of the Illinois Department of Conservation states that waterskiing is done on the Illinois River, the Mississippi River, and the

Wabash River. A waterskiier may well take a spill right in the undiluted effluent plume of a sewage plant where the fecal coliform level may be as high (or higher), than the 500,000 level per 100 ml used by Dr. Haas as coming from the Metropolitan Sanitary District of Greater Chicago's plants.

There are other aspects which have not fully been considered by the majority. While the opinion (p.16) concludes that there is "little risk" to cattle and hogs it does not address the calf typhoid potential. The report titled "Health Effects Due to the Cessation of Chlorination of Wastewater Treatment Plant Effluent" by Janet Holden of the School of Public Health of the University of Illinois at Chicago is in this record. On p.74 of it the reference is given to calf typhoid occurring from hay grown on ground flooded by a stream polluted with sewage. The bacteria deposited on the grass were shown to survive natural drying and remain virulent in the winter.

It is important to maintain the distinction between "disinfection" and "chlorination". If chlorine residuals as such do pose environmental threats to fish or to humans (from trihalo-methanes) then an alternative disinfection method could be required. The Bergen County, N.J. research showed that ultra-violet disinfection is as effective as chlorination and no more costly. The majority opinion does not mention ultra-violet's proven advantages over chlorination of having no chlorine residual and not creating chlorinated organics--all at the same cost.

The majority opinion mistakenly equates a "case-by-case" determination with the need for 1,500 separate, site-specific rulemaking proceedings (pp.18-19). All that was needed was to retain a water quality standard for swimming and water skiing areas (the major rivers of Illinois and lakes and reservoirs). The IEPA's permit process would do the rest. IEPA, using generally accepted decay models for bacteria (pp.11-12) would simply make the computation and require disinfection if needed as a permit condition. In air pollution control, air quality standards must always be met. IEPA does far more difficult air modelling now when issuing air permits.

My preference, in this proceeding, would have been to first drop winter chlorination (from November 15 to May 1). Then actual field measurements of fecal coliform levels could have been made in April and in November. Once these data were gathered the Board could make a further determination on modifying summer chlorination.

There is a public health risk even in dropping winter chlorination. Edwin E. Geldreich, the noted research microbiologist at the U.S. Municipal Environmental Research Laboratory in a November 6, 1981 letter states:

"While ingestion of water through drinking may be the major vehicle of transport to the intestinal tract, body contact in recreational use of water cannot be ignored. This would include swimming, skiing, and canoeing in a river since in these forms of recreational activity, hands and mouth will come in contact with the water. If the water in contact contains pathogenic organisms, these organisms will reach the mouth directly or by hand to mouth transfer and be ingested. This transfer of pathogen exposure from water to person is not unlike the acknowledged transfer of pathogens in person to person contacts (sneezing, coughing, hands, body)."

Thus, it seems to me, that even hunters and fishermen will be at some risk with the dropping of winter disinfection. A fisherman will be handling his lines and any fish caught in a polluted stream. His hands will be a potential source of pathogen transfer when he eats lunch. The hunter may wash his hands in a polluted stream and thus unknowingly ingest pathogens when he eats his sandwiches.

The dropping of winter chlorination will also increase virus levels in the waters of Illinois. Potable water systems have expressed a concern about enteroviruses (February 9, 1982, R. 236). Some viral diseases are hepatitis and polio.

The Lake County Health Department, in its letter of September 30, 1977 by Eugene Theios, M.P.H. then director of the environmental health division, points out that people swim at private beaches and in lakes and along rivers. Also, "swimming holes" exist in parks that are unofficial bathing areas. He also points out that swimming may take place before May 1 or after September 30 if the weather is warm enough. The public, at any of these locations and times of the year would obviously not be protected. And how would they ever know that they were not protected?

Mr. Richard A. Wissell, M.P.H., Public Health Administrator for the McHenry County Department of Health, in his letter in the record of February 9, 1982 states; "All up and down the Fox River in our County, people water ski and swim from the banks of their property."

Messrs. Theos and Wissell are both stating that people will swim and water ski in the rivers and lakes of Illinois. We cannot and should not prevent that entirely legitimate and desirable recreational use of our waters. But we should protect the health of those users.

As the public learns that Illinois rivers, lakes, and reservoirs may not be safe to swim or water ski upon, tourism is bound to be adversely affected. These adverse economic impacts were not considered in this proceeding.

The Second Notice enacted today by the majority is much looser (more lenient) than the First Notice enacted by this Board on October 8, 1981. That First Notice would have protected the entire reach of the Illinois River from the Stratton State Park at Morris to the confluence with the Mississippi River. It also would have protected all "lakes". The intent is using the word "lakes" was to define that as meaning bodies of water on which water skiing was possible.

The legal argument then exists that the Second Notice goes far beyond First Notice. The million or so people in Central Illinois who look to the Illinois River for recreational usage can legitimately assert that they did not participate nor object to the First Notice because it did not purport to affect them. Similarly, residents and users of all lakes and reservoirs could say the same thing.

Earlier in this statement it was mentioned that 6,895,849 people of Illinois have objected to the action of the Board majority. But it is really more than that in numbers. The Illinois Section of the American Water Works Association in their testimony of February 9, 1982 (Michael Curry) expressed their concerns for the safety of potable public water systems (R.225-251). Most of the Illinois population is served by potable public water supplies (as against individual wells). Thus about 10,000,000 people in Illinois (the customers) were represented by the AWWA group and its statement of concern.

The Illinois Department of Public Health represents all 11,418,461 Illinoisans. Its then Director, Paul Q. Peterson, M.D., in a statement in this record, stated:

"The Department of Public Health wishes to point out that in IEPA's effort to have fecal coliforms removed as an indicator of water quality, it does not offer any alternative indicators for the Department's use. Granted, there are a variety of specific organisms which can be tested for, but none correlate with water quality any better than fecal coliforms, and are more difficult and costly to monitor as well as interpret...The Department will continue to use fecal coliforms as an indicator of water quality, and recommends that the Pollution Control Board continue to retain fecal coliform as an indicator until such time that a more suitable parameter is found." (underlining added).

The majority in today's action has not "retained fecal coliform as an indicator." I would have kept a water quality standard of 500 fecal coliforms per 100 ml (the Chicago beach closing standard) in force for the summer swimming and water skiing season.

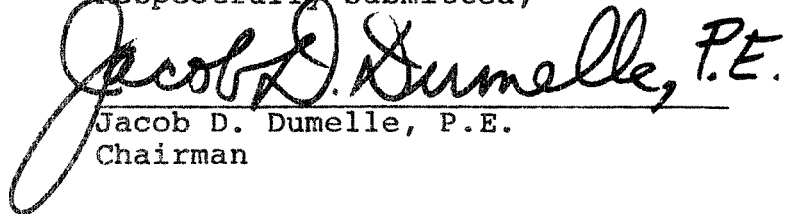
Perhaps it all was said best by Janet Holden of the School of Public Health of the University of Illinois at Chicago. In her conclusions she stated;

"Swimming in waters that have been contaminated by sewage or wastewater treatment plant effluents has been directly implicated as the cause of infectious disease. The concentrations of pathogenic organisms which are needed to cause such diseases is not known. Thus, neither the concentration of indicator organisms needed to insure safe swimmable waters nor the distance from a wastewater outfall needed for a body of water to purify itself sufficiently for use for swimming is known." (p.88)

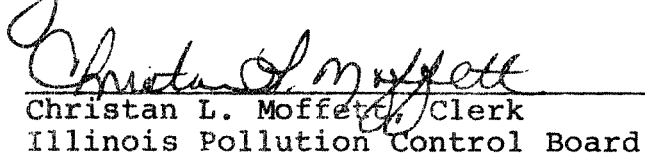
The majority decision is not logically consistent. It purports to protect swimmers at licensed beaches but completely neglects to protect swimmers and water skiers not at licensed beaches. And, in fact, if Dr. Haas is correct, the majority's new rule may not even protect through the "20 mile" distance.

I would urge concerned counties and cities to (a) do water quality testing for fecal coliforms after disinfection ceases, (b) try to get additional river, lake, and reservoir beaches licensed in order to trigger the partial protection of the 20 mile distance and (c) bring this matter back to the Board again with new data on water quality and illness incidence.

Respectfully submitted,

  
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Jacob D. Dumelle, P.E.  
Chairman

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify that the above Dissenting Opinion was filed on the 23<sup>rd</sup> day of August, 1982.

  
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Christan L. Moffett, Clerk  
Illinois Pollution Control Board