

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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

NOTICE OF FILING

To: ALL COUNSEL OF RECORD
(Service List Attached)

PLEASE TAKE NOTICE that on the 3rd day of January, 2011, I electronically filed with the Office of the Clerk of the Illinois Pollution Control Board, the **Metropolitan Water Reclamation District of Greater Chicago's Final Comments on the Proposed Effluent Bacteria Standards.**

Dated: January 3, 2011.

**METROPOLITAN WATER RECLAMATION
DISTRICT OF GREATER CHICAGO**

By: /s/ Fredric P. Andes
One of Its Attorneys

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PROOF OF SERVICE

The undersigned attorney certifies, under penalties of perjury pursuant to 735 ILCS 5/1-109, that I caused a copy of the foregoing, **Notice of Filing** and **Metropolitan Water Reclamation District of Greater Chicago's Final Comments on the Proposed Effluent Bacteria Standards**, to be served via First Class Mail, postage prepaid, from One North Wacker Drive, Chicago, Illinois, on the 3rd day of January, 2011, upon the attorneys of record on the attached Service List.

/s/ David T. Ballard

David T. Ballard

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CHICAGO AREA WATERWAY SYSTEM)
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PROPOSED AMENDMENTS TO 35 ILL.)
ADM. CODE 301, 302, 303, AND 304)

**METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO’S
FINAL COMMENTS ON THE PROPOSED EFFLUENT BACTERIA STANDARDS**

The Metropolitan Water Reclamation District of Greater Chicago (the District), by its attorneys Barnes & Thornburg LLP, hereby submits these comments on the proposed rule establishing effluent bacteria standards for discharges to the Chicago Area Waterway System (“CAWS”) and Lower Des Plains River (“LDPR”) (the “Proposed Rule”).

The Illinois Environmental Protection Agency (“IEPA” or the “Agency”), as part of its proposed rulemaking concerning the CAWS and LDPR, has proposed an addition to the state Effluent Standards, found in 35 Ill. Adm. Code Part 304, as follows:

**SUBPART B: SITE SPECIFIC RULES AND EXCEPTIONS NOT
OF GENERAL APPLICABILITY**

**304.224 Effluent Bacteria Standards for Discharges to the Chicago
Area Waterway System and Lower Des Plaines River**

Effluents discharged to the Incidental Contact Recreation waters listed in 35 Ill. Adm. Code 303.220 and the Non-Contact Recreation waters listed in 35 Ill. Adm. Code 303.225 shall not exceed 400 fecal coliforms per 100 ml during the recreational season lasting from March 1 through November 30. All effluents in existence on or before the effective date of this Section shall meet these standards by March 1, 2011. All new discharges shall meet these standards upon the initiation of discharge.¹

¹ IEPA Statement of Reasons, 92 (Oct. 26, 2007).

IEPA indicated that the numeric bacteria limitation would require the District to disinfect its effluent at three facilities: North Side, Stickney, and Calumet.²

IEPA, however, has failed to satisfy the requirements for adoption of effluent standards. First, the Proposed Rule is not necessary to prevent pollution that would be harmful to public health, as required by the Illinois Environmental Protection Act. The District has demonstrated empirically that existing bacteria levels in the CAWS are not associated with any increased risk of illness from recreation during dry weather. As a result, disinfection of wastewater treatment plant effluents is not necessary to protect the recreational uses proposed for the CAWS. Second, the Proposed Rule is not economically reasonable in light of the lack of public health benefits disinfection would provide, in contrast to the significant costs and adverse environmental impacts that would result from disinfection. The significant costs of installing and operating disinfection processes at District facilities would impose an unnecessary financial burden on the residents of Cook County. Those costs would also hamper the District's ability to adequately maintain and upgrade its existing facilities as necessary to comply with existing requirements, as well as to implement other improvements that would result in additional water quality benefits. Finally, operation of disinfection technologies would require significant increases in energy use at District facilities, resulting in adverse environmental impacts from the associated air emissions. Because disinfection is not necessary to support recreational uses and involves substantial costs and environmental impacts with no resulting health benefit, the Proposed Rule is not reasonable—economically or otherwise—and the Illinois Pollution Control Board (the “Board”) should decline to adopt it.

² *Id.* at 100.

STATUTORY AUTHORITY

Title III of the Illinois Environmental Protection Act (the “Act”) contains the General Assembly’s findings concerning water pollution, with the purpose, among others, of protecting health and preventing pollution, as follows:

It is the purpose of this Title to restore, maintain and enhance the purity of the waters of this State in order to protect health, welfare, property, and the quality of life, and to assure that no contaminants are discharged into the waters of the State, as defined herein, including, but not limited to, waters to any sewage works, or into any well, or from any source within the State of Illinois, without being given the degree of treatment or control necessary to prevent pollution, or without being made subject to such conditions as are required to achieve and maintain compliance with State and federal law...³

The goal of preventing pollution is understood in the context of “water pollution,” which the Act defines with reference to public health and safety, among other things:

“Water pollution” is such alteration of the physical, thermal, chemical, biological or radioactive properties of any waters of the State, or such discharge of any contaminant into any waters of the State, as will or is likely to create a nuisance or render such waters harmful or detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate uses, or to livestock, wild animals, birds, fish, or other aquatic life.⁴

The Board is granted the authority to adopt effluent standards, such as the one proposed here by IEPA, in order to promote the purposes of the Act:

The Board, pursuant to procedures prescribed in Title VII of this Act, may adopt regulations to promote the purposes and provisions of this Title. Without limiting the generality of this authority, such regulations may among other things prescribe:

(2) Effluent standards specifying the maximum amounts or concentrations, and the physical, chemical, thermal, biological and radioactive nature of contaminants that may be discharged into the waters of the State, as

³ 415 ILCS 5/11(b) (emphasis added).

⁴ 415 ILCS 5/3.545.

defined herein, including, but not limited to, waters to any sewage works, or into any well, or from any source within the State...⁵

Viewed together, these statutory provisions provide a framework for the Board in considering whether to adopt the Proposed Rule requiring disinfection. Effluent standards such as the Proposed Rule, in order to “promote the purposes” of the Act, must be “necessary to prevent pollution” that would “render...waters harmful or detrimental or injurious to public health, safety or welfare.”⁶ Board decisions confirm that necessity is a threshold factor that must be considered. For example, the Board has determined that where “the condition is not necessary to achieve compliance with the Act and regulations, it may be said that the condition is unreasonable.”⁷ Indeed, the very purpose of Subdocket B in this rulemaking is for the Board to determine “whether or not disinfection may or may not be necessary to meet” the use designations proposed for the CAWS.⁸ As a result, the Board should adopt the Proposed Rule only if it is necessary to prevent pollution that would be harmful to public health.

In addition, the Act provides further guidance to the Board when considering proposed regulations, including effluent standards. The Board is directed to consider a number of factors, including receiving water quality and economic reasonableness, before promulgating any regulations:

In promulgating regulations under this Act, the Board shall take into account the existing physical conditions, the character of the area involved, including the character of surrounding land uses, zoning classifications, the nature of the existing air quality, or receiving body of water, as the case may be, and the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution.⁹

⁵ 415 ILCS 5/13(a).

⁶ 415 ILCS 5/3.545, 5/11(b), 5/13(a) (emphasis added).

⁷ *Citizens Utilities Co. of Illinois v. IEPA*, PCB 85-140, at 6 (Oct. 16, 1992).

⁸ Board Order at 20 (Mar. 18, 2010).

⁹ 415 ILCS 5/27(a).

The Board should adopt the Proposed Rule only if it is necessary under the Act, and only if the disinfection requirement imposed by the Proposed Rule is economically reasonable.¹⁰ In addition, the Illinois Supreme Court has indicated that the Board should consider the effects of the proposal for the specific water body in question, and must “use its technical expertise and judgment in balancing any hardship that the regulations may cause to dischargers against its statutorily mandated purpose and function of protecting our environment and public health.”¹¹

DISCUSSION

The Board should not adopt the Proposed Rule, because it does not satisfy the statutory requirements set forth above. Recreation on CAWS waters have been demonstrated to present no additional human health risk as compared to other waters receiving disinfected or no effluent. In addition, existing levels of bacteria in the CAWS are not related to any adverse health effects. Thus, a bacterial effluent standard that would require disinfection cannot be considered necessary to serve the purposes of the Act. In addition, the significant costs and adverse environmental impacts from energy use, air emissions, and land use that would result from imposing a disinfection requirement on the District facilities are not reasonable—particularly when balanced against the lack of any public health benefit. The Board should decline to adopt the Proposed Rule because it is unnecessary and economically unreasonable.

I. Disinfection is not Necessary to Protect Public Health

As discussed above, the Board should adopt effluent standards only if they are necessary to prevent pollution that would render the receiving water injurious to public health.¹² The

¹⁰ See, e.g., *In re Proposed 35 Ill. Adm. Code 304.123(g), et al.*, PCB R04-26, 4 (Opinion and Order, Jan. 19, 2006) (“Phosphorous Order”) (“An effluent standard is mainly intended to limit significant loading of a pollutant to a receiving stream giving consideration to availability of appropriate treatment technology and associated costs.”).

¹¹ *Granite City Division of National Steel Co. v. IPCB*, 155 Ill. 2d 149, 183, 613 N.E.2d 719, 734-35 (1993).

¹² 415 ILCS 5/3.545, 5/11(b), 5/13(a). Although IEPA indicated that the numeric bacteria limitation was “a technology-based value designed to assure that disinfection technologies are functioning properly,” the agency has

Proposed Rule, however, would impose disinfection requirements that are not necessary to protect public health or support the recreational uses proposed for the CAWS.

A. Recreation on the CAWS Poses No Increased Health Risk

At current and historical levels of bacteria and other pathogens in the CAWS, there have been no documented public health outbreaks resulting from recreational use of the CAWS.¹³ Dr. Dorevitch summarized available disease information as follows:

If there were known outbreaks of disease linked to CAWS recreation, I would suggest public health action now, rather than research. However, I am not aware of epidemics attributed to CAWS recreation. Since 1978, the U.S. Centers for Disease Control and Prevention has monitored disease outbreaks linked to water recreation. Using “WBDOSS,” the Waterborne Disease Outbreak Surveillance System, the CDC compiles information about outbreaks due to treated and untreated recreational waters. Hundreds of outbreaks and thousands of cases of illness have been identified, described, and in varying degrees, investigated over the years. Outbreaks from Illinois – including a recent outbreak of *Cryptosporidiosis* in Tazewell County – have been reported. To the best of my knowledge, local health departments, the Illinois Department of Public Health, and the CDC have not identified outbreaks of disease attributed to CAWS recreation.¹⁴

Although some recreators have testified that they occasionally feel uneasy about exposure to waters that receive undisinfecting effluent, the thousands of recreators that use the CAWS are evidence that many recreators agree that the waters are safe enough for recreational activities.¹⁵

also confirmed that the purpose of that effluent standard is to protect the incidental contact uses proposed for the CAWS. IEPA Statement of Reasons, 92 (Oct. 26, 2007); Jan. 29, 2008 Hearing, Testimony of Twait, at 176-177. In addition, the Board has indicated that the purpose of Subdocket B is to determine “whether or not disinfection may or may not be necessary to meet those use designations.” Board Order at 20 (Mar. 18, 2010). As a result, the necessity of disinfection to protect secondary contact recreational uses is an appropriate inquiry here.

¹³ Pre-Filed Testimony of Granato, at 5 (Aug. 4, 2008).

¹⁴ Pre-Filed Testimony of Dorevitch, at 3-4 (Aug. 4, 2008).

¹⁵ See May 6, 2009 Hearing, Testimony of Bamonte, at 71-72 (“I would feel much better paddling in CAWS” with disinfection); Oct. 5, 2009 Hearing, Testimony of Adelman, at 158 (Executive Director of Openlands describing the organization’s efforts to improve access and enable more and easier use of the CAWS); Oct. 5, 2009 Hearing, Testimony of Crivello, at 52 (“MR. ANDES: But since you’ve recreated in these waters at least three times a month, you don’t believe they’re personally unsafe? MR. CRIVELLO: No, not for incidental contact, you know.”).

Despite the absence of a known public health risk from CAWS recreation, the District has been supportive of efforts to further investigate possible health issues, including in support of a rulemaking effort for the CAWS. As Dr. Thomas Granato has testified, the District participated in and supported IEPA's Use Attainability Analysis (UAA) Study efforts that preceded this rulemaking.¹⁶ At the time, IEPA and the District agreed that a thorough understanding of the CAWS was required before scientifically sound recommendations concerning the recreational use and potential and associated protective standards can be established given the unique man-made and altered waterways of the CAWS.¹⁷

IEPA requested that the District undertake and support a structured scientific assessment approach designed to evaluate the need and, if necessary, provide the basis for generating numeric water quality standards for the proposed recreational use designations.¹⁸ To assist IEPA in making this determination, and at the Agency's request, the District initiated a multi-phase research program, and has invested substantial funds (over \$10 million) on expert studies to assess recreational health risks and protect the identified uses of the CAWS.¹⁹ The key focus of that research program has been the assessment of the risks to human health for the identified recreational uses, particularly in light of the current practice of not disinfecting the effluents that discharge to the CAWS.²⁰ The research conducted by the District in support of IEPA's efforts resulted in two major efforts: the Dry and Wet Weather Risk Assessment of Human Health Impacts of Disinfection vs. Non-Disinfection of the Chicago Area Waterways System (the "Risk

¹⁶ Pre-Filed Testimony of Granato, at 2 (Aug. 4, 2008).

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ *Id.* at 2-3.

²⁰ *Id.* at 3.

Assessment”); and the Chicago Health, Environmental Exposure, and Recreation Study (“CHEERS”). Reports from both efforts were filed with the Board, and are summarized below.

1. Microbial Risk Assessment Report

One component of the District’s research program was the Risk Assessment, developed for the District by a team of nationally-recognized experts in risk assessment and bacterial human health effects, lead by Geosyntec.²¹ The objective of the Risk Assessment “was to evaluate the human health impact of continuing the current practice of not disinfecting the effluents from the District’s Calumet, North Side, and Stickney [water reclamation plants] versus initiating disinfection of the effluent at these three [plants].”²²

The Risk Assessment concluded that low pathogen levels in the District plants’ effluents and in the CAWS downstream of those plants posed minimal risk for gastrointestinal illness associated with recreational use on the CAWS.²³ Pathogen levels were found to be generally low, and were associated with “a low probability of developing gastrointestinal illness, even for the most highly exposed recreational users in areas of the CAWS in close proximity to non-disinfected effluents from Stickney, Calumet and North Side plants.”²⁴ In fact, the risks associated with incidental contact recreational practices on the CAWS are below the most conservative risk threshold that U.S. EPA applies to criteria for primary contact recreation.²⁵ Risks that did exist were “mainly due to secondary loading of the waterway under wet weather conditions from CSOs and other discharges, which would not be improved by disinfection of

²¹ See Risk Assessment, at xiii; Pre-Filed Testimony of Tolson, at 1, Attachments 2-3 (Aug. 4, 2008); Pre-Filed Testimony of Gerba, at 1, Attachments 1-2 (Aug. 4, 2008); and Pre-Filed Testimony of Petropoulou, at 1, Attachments 2-3 (Aug. 4, 2008).

²² Risk Assessment at xiv; see also Pre-Filed Testimony of Petropoulou, at 1-2.

²³ Pre-Filed Testimony of Granato, at 4 (Aug. 4, 2008).

²⁴ Pre-Filed Testimony of Tolson, at 7.

²⁵ Risk Assessment, at xxxi; Pre-Filed Testimony of Granato, at 7 (Aug. 4, 2008).

effluent from the District's water reclamation plants."²⁶ The Risk Assessment conclusions were summarized as follows:

The results from this study indicate that, despite elevated levels of fecal indicator bacteria, the concentrations of actual pathogenic organisms in the waterway are low. Given the low pathogen levels in the waterway, there is a low probability of developing gastrointestinal illness even in areas of the CWS in close proximity to the District's non-disinfected WRP [water reclamation plant] effluents. For the designated recreational uses evaluated, the risks of developing illness, both with and without disinfection for each waterway segment, are below the EPA guideline of 14 illnesses per 1,000 exposures for fresh water recreation including immersion and swimming. The pathogen concentrations within the waterway are largely a result of non-WRP derived wet weather inputs.²⁷

2. CHEERS Study

As noted above, CHEERS was funded by the District in part at the request of IEPA, and is the first epidemiological study of the health risks of fishing, boating, rowing and padding in the CAWS.²⁸ In fact, CHEERS was also the first comprehensive epidemiological study of secondary contact recreation conducted anywhere in the country.²⁹ Epidemiological studies provide an opportunity to directly measure rather than model risk.³⁰ For this reason, U.S. EPA places considerable weight on epidemiological studies when establishing environmental standards.³¹

CHEERS used the gold standard of observational epidemiological studies—the prospective cohort design—and followed the study format used for the U.S. EPA's National

²⁶ Pre-Filed Testimony of Tolson, at 2; Pre-Filed Testimony of Petropoulou, at 9.

²⁷ Risk Assessment, at xxxiv-xxxv. Also, note that U.S. EPA has provided the District with comments on the Risk Assessment. The District responded to those comments on December 30, 2010, and filed those responses with the Board on January 3, 2011.

²⁸ CHEERS Report, at iv (Frequently Asked Questions about CHEERS ("FAQ")) (filed with the Board on August 31, 2010); Pre-Filed Testimony of Granato, at 2-3 (Sept. 20, 2010); Pre-Filed Testimony of Dorevitch, at 2 (Sept. 20, 2010).

²⁹ Pre-Filed Testimony of Dorevitch, at 2 (Aug. 4, 2008).

³⁰ Pre-Filed Testimony of Dorevitch, at 3 (Sept. 20, 2010).

³¹ *Id.*

Epidemiological and Environmental Assessment of Recreation (NEEAR) Water Study, which will be used to generate national microbial water quality criteria for primary contact recreational waters.³² The study design was developed by a multi-disciplinary team of experienced researchers with backgrounds in infectious disease medicine, environmental medicine, epidemiology, biostatistics, industrial hygiene, and environmental science.³³ A panel of recognized leaders in the fields of water microbiology and health from the U.S. Centers for Disease Control and Prevention, the U.S. EPA, and several universities reviewed and endorsed the designs and protocols of the research, and monitored the quality of the data collected and its analysis and interpretation.³⁴

Dr. Dorevitch described the CHEERS study process as follows:

For the CHEERS Study, people were recruited into one of three study groups. The CAWS Group was composed of people who row, paddle, fish or go boating on the Chicago Area Waterways System. The General Use Waters Group consisted of people who do these same activities on a number of area lakes, rivers and lagoons not including the CAWS. The Unexposed Group included people who do outdoor activities that do not involve water (such as jogging and biking) at about the same time and place as the participants in the other two groups.

Individuals in all three groups underwent interviews on the day of recreation, and then were contacted for three telephone interviews over the following three weeks. Field interviews addressed current health, and for those who engaged in water recreation, the extent of their contact with the water. Telephone interviews addressed changes in health status and additional water exposure since recruitment. While participants were on the water, samples of water were collected and sent for analyses of bacteria, viruses and parasites. Water was sampled for analyses of indicator microbes once every two hours, and once every six hours for pathogen analyses. At CAWS locations, water was sampled upstream and downstream of the nearest upstream water reclamation plant during the time of participant recruitment. If a participant developed an illness,

³² *Id.* at 2; CHEERS Report, at i (Abstract), xxv (Executive Summary).

³³ Pre-Filed Testimony of Granato, at 3 (Sept. 20, 2010); Pre-Filed Testimony of Dorevitch, at 2 (Sept. 20, 2010).

³⁴ Pre-Filed Testimony of Granato, at 3 (Sept. 20, 2010); Pre-Filed Testimony of Dorevitch, at 2 (Sept. 20, 2010); CHEERS Report, at xxv (Executive Summary).

clinical specimens were collected so that the pathogen responsible for illness could be identified. The study used state of the art methods, based on those of the U.S. EPA's ongoing research about primary contact recreation, the NEEAR study.

A total of 11,733 people completed the field interviews and 11,297 (96.4%) participated in a telephone follow-up for the CHEERS Study.³⁵

Water was tested for microbes including bacteria, viruses, and protozoa.³⁶ Over 5,000 water samples were analyzed and 750 stool samples were obtained for analysis by the University of Illinois at Chicago laboratory and the Illinois Department of Public Health.³⁷

a. Initial CHEERS Report Results

CHEERS was designed to investigate the occurrence of illness associated with secondary contact recreation on the CAWS.³⁸ Dr. Dorevitch explained the methodology for evaluating health risks as follows:

A multi-step process was used to evaluate the risks of canoeing, fishing, kayaking, motor boating and rowing. First, a conceptual model was developed that linked water recreation to illness. Second, time periods of interest for evaluating the occurrence of each type of illness were defined. Third, statistical analyses were conducted to identify associations between the study group – meaning CAWS, general use waters, and unexposed – and the risk of illness, after taking into account other differences between study groups (such as age composition or baseline health status). Fourth, the frequency of illness attributable to CAWS recreation was estimated. Finally, the finding[s] were carefully reviewed to ensure they were not the result of specific choices of statistical methods or definitions used. In other words, the research team re-analyzed the data using a variety of approaches to make sure that our results were solid. In addition, the severity of illness was evaluated by asking study participants whether their symptoms resulted in the use of over-the-counter medication, evaluation by a healthcare provider, interference with daily activities, and [*sic*] emergency room visit, and/or hospitalization. Measures of illness severity were summarized for each type of illness, for all three study groups.

³⁵ Pre-Filed Testimony of Dorevitch, at 4 (Sept. 20, 2010).

³⁶ CHEERS Report, at i (Abstract), vii (FAQ), xxvi (Executive Summary).

³⁷ Pre-Filed Testimony of Dorevitch, at 6 (Sept. 20, 2010).

³⁸ Pre-Filed Testimony of Granato, at 3 (Sept. 20, 2010).

Statistical testing evaluated whether differences in severity existed among the groups.³⁹

Dr. Gorelick confirmed that the CHEERS approach was sound, and that its results were valid. Specifically, Dr. Gorelick testified as follows:

MS. ALEXANDER: One more question. Dr. Gorelick, were you present yesterday when Dr. Dorevitch testified effectively that he would be surprised if another epidemiological study conducted on the CAWS with roughly the same scope came to a different conclusion or had different results concerning risk? Do you agree that would be very surprising if there was a different result in a different study?

DR. GORELICK: The most likely result would be a similar result to what they found. If you think back to the figures that – I think they were entered as exhibits, but the three posters that were presented that showed the rates of illness and the comparisons of the rates of illness....

There's an estimate of the rate of illness is 12 per thousand, and then there are some error bars around that. Error bars are what we call the 95 percent confidence interval. And what that means is if I did exactly what you suggested, if I can convince the District to give me all that money to do the study again because they wanted to replicate the results, and I did it again, that I would – 95 percent of the time if I repeat it, I would find a result that would be somewhere within that margin of error.

The most likely thing is it would be pretty close to what he found, but it would not be all that surprising if it were anywhere within that range. That's why we present those ranges. So he found a difference between CAWS and general use of 0.6, but the confidence interval went anywhere from ten more in the CAWS to 10 fewer in the CAWS.

If I did that experiment – or if I did that study and I found a difference of six, that would be completely statistically consistent with the results of the CHEERS study because it falls within that 95 percent confidence level.⁴⁰

The CHEERS Report was submitted to the Board on August 31, 2010.⁴¹ The initial CHEERS Report presented findings on the rates of acute gastrointestinal and non-gastrointestinal illness attributable to CAWS recreation, and also identified the pathogens responsible for acute

³⁹ Pre-Filed Testimony of Dorevitch, at 5 (Sept. 20, 2010).

⁴⁰ Oct. 20, 2010 Hearing, Testimony of Gorelick, at 134-35.

⁴¹ Pre-Filed Testimony of Granato, at 3 (Sept. 20, 2010); Pre-Filed Testimony of Dorevitch, at 3 (Sept. 20, 2010).

infections among recreators.⁴² The CHEERS Report concluded that rates of gastrointestinal illness are not higher among CAWS recreators as compared to recreators participating in the same activities on general use waters that do not receive undisinfected wastewater treatment plant effluent.⁴³ On CAWS waters, approximately 12-13 cases of gastrointestinal illness per 1,000 uses can be attributed to the types of incidental or non-contact recreational uses that are proposed for the CAWS.⁴⁴ This rate is statistically indistinguishable from the rate of gastrointestinal illness attributable to limited contact recreation on general use waters.⁴⁵ About 13-14 cases of gastrointestinal illness were attributed to recreators on non-CAWS waters.⁴⁶

The CHEERS Report did include a significantly different incidence of eye symptoms among CAWS recreators than those on general use waters, with an incidence rate of 15-16 cases per 1,000 uses.⁴⁷ The increased incidence of eye symptoms, however, was likely due to lower rates of hand washing among CAWS recreators who ate or drank.⁴⁸ Eye symptoms reportedly were very minor in most cases, generally not requiring any medication, or requiring only use of over-the-counter medications.⁴⁹ Other types of illness, including skin, ear, and respiratory

⁴² Pre-Filed Testimony of Granato, at 3 (Sept. 20, 2010).

⁴³ *Id.*; Pre-Filed Testimony of Dorevitch, at 6 (Sept. 20, 2010).

⁴⁴ CHEERS Report, at i (Abstract), ix (FAQ), xxxi (Executive Summary); Pre-Filed Testimony of Granato, at 3-4 (Sept. 20, 2010); Pre-Filed Testimony of Dorevitch, at 6 (Sept. 20, 2010). These findings are consistent with the Risk Assessment, which estimated a less than 8 in 1,000 risk of illness due to pathogens alone, rather than total risk associated with recreational activities due to pathogens and all other causes. Pre-Filed Testimony of Tolson, at 7; Oct. 19, 2010 Hearing, Testimony of Granato, at 254-55.

⁴⁵ CHEERS Report, at ix (FAQ), xxx (Executive Summary); Pre-Filed Testimony of Granato, at 3-4 (Sept. 20, 2010).

⁴⁶ CHEERS Report, at ii (Abstract), ix (FAQ), xxxi (Executive Summary).

⁴⁷ CHEERS Report, at i (Abstract), ix (FAQ); Pre-Filed Testimony of Dorevitch, at 6 (Sept. 20, 2010).

⁴⁸ Oct. 19, 2010 Hearing, Testimony of Dorevitch, at 196 (“If I restrict that analysis only to the people who ate or drank, then taking into account handwashing makes the difference between the CAWS group and the general use group disappear.”).

⁴⁹ CHEERS Report, at ix (FAQ); Pre-Filed Testimony of Granato, at 4 (Sept. 20, 2010); Pre-Filed Testimony of Dorevitch, at 6 (Sept. 20, 2010).

symptoms, were reported at similar rates for CAWS recreators, general use water recreators, and non-water recreators alike.⁵⁰

The prevalence of illness reported in CHEERS among recreators with the lowest water exposure underlines the lack of relationship between exposure and illness. Fishing and motor boating were associated with the highest rates of gastrointestinal illness, even though exposure to water was lower for that group compared to canoeing and kayaking.⁵¹ Dr. Dorevitch explained this finding as follows:

For the fishers, at least, they have exposure to recreational water, but they also have exposure to bait and to fish and, again, this is just my explanation, not something that comes out of the data, but that handling of the bait and the fish is transferring microbes to their hands that they end up ingesting and there have been published studies about Altamar urban anglers getting cryptosporidium cysts on their hands and they are at risk of ingesting. The motorboaters is more problematic for me to explain. They point to something that we didn't ask about and that's alcohol intake. And that on boats there's alcohol and alcohol causes gastrointestinal symptoms and had I known I would have wound up with results like this I would have added questions about alcohol intake, but that's not part of the survey and I'm not really able to differentiate alcohol associated illness from other causes.⁵²

Dr. Gorelick confirmed that alcohol could be causing the illness associated with motor boating.⁵³

For those CHEERS participants who did report gastrointestinal illness after participating in recreational activities, the detection of pathogens in stool samples was just as common for CAWS recreators, general use water recreators, and non-water recreators.⁵⁴ The vast majority of pathogens identified in stool samples were viruses, including rotavirus, norovirus, and other

⁵⁰ CHEERS Report, at i (Abstract), ii (Abstract), ix (FAQ).

⁵¹ CHEERS Report, at xxx (Executive Summary); Oct. 19, 2010 Hearing, Testimony of Dorevitch, at 89-90, 181-84.

⁵² Oct. 19, 2010 Hearing, Testimony of Dorevitch, at 182-84.

⁵³ Oct. 20, 2010 Hearing, Testimony of Gorelick, at 103-104.

⁵⁴ CHEERS Report at xl (Executive Summary).

enteric viruses.⁵⁵ Pathogens such as Salmonella, Shigella, and E. coli O157:H7, which have resulted in severe waterborne outbreaks of gastrointestinal illness elsewhere, were not identified in samples from CAWS or general use recreators.⁵⁶ As a result, the CHEERS Report concluded that CAWS use could not be associated with the presence of waterborne pathogens in stool samples from users with gastrointestinal illness.⁵⁷

b. CHEERS Supplement Results

The CHEERS Supplement quantified the relationship between water quality and health risk, by investigating the extent of any relationship between reported illness and various microbes.⁵⁸ Among CAWS recreators overall, there was no relationship between microbe concentration and occurrence of gastrointestinal illness.⁵⁹ In contrast, gastrointestinal illness for General Use water recreators could be predicted based on levels of enterococci.⁶⁰ For example, when enterococci levels were 250 cfu/100 mL, the rate of attributable gastrointestinal illness could be estimated at approximately 11 cases per 1,000 uses.⁶¹ For heavily-exposed CAWS users, the occurrence of a recent combined sewer overflow event was associated with an increased risk of developing gastrointestinal illness.⁶² This conclusion is consistent with the Risk

⁵⁵ *Id.*; Pre-Filed Testimony of Granato, at 4 (Sept. 20, 2010); Pre-Filed Testimony of Dorevitch, at 6 (Sept. 20, 2010).

⁵⁶ CHEERS Report, at ix (FAQ); Pre-Filed Testimony of Dorevitch, at 7 (Sept. 20, 2010); Pre-Filed Testimony of Granato, at 4 (Sept. 20, 2010).

⁵⁷ CHEERS Report, at xl (Executive Summary).

⁵⁸ The CHEERS Supplement was filed with the Board on December 6, 2010.

⁵⁹ CHEERS Supplement, at iii, ES-18.

⁶⁰ *Id.* at ES-18.

⁶¹ *Id.*

⁶² *Id.* at ES-20.

Assessment, which estimated higher risks during wet weather events.⁶³ Disinfection at District plants, however, will do nothing to lower the risks associated with CSO discharges.⁶⁴

B. Disinfection Would Provide No Public Health Benefit

The bacterial effluent standard contained in the Proposed Rule is set at a level normally associated with support of designated uses involving more significant water contact or immersion, such as drinking water supply, swimming, or shell fishing.⁶⁵ Here, however, IEPA itself has concluded that such uses are not attainable, and has instead proposed incidental and non-contact recreational uses for the CAWS.⁶⁶ Because of the minimal risks of adverse health effects from the types of recreational uses proposed for the CAWS, compliance with the Proposed Rule using disinfection is not necessary to support those uses.

The Risk Assessment “sought to estimate the effect of disinfection of the effluent from the water reclamation plants on microbial risk,” and concluded that disinfection of effluent from the water reclamation plants would have minimal effects on overall recreational illness rates.⁶⁷ The report concluded that disinfection at the District’s plants during wet weather would not improve the microbiological water quality in the CAWS downstream of the District’s reclamation plants in terms of maintaining the proposed bacteria effluent standard levels in ambient water, due to the higher concentrations of fecal coliform introduced into the CAWS from other sources.⁶⁸ Dr. Tolson explained as follows:

⁶³ Pre-Filed Testimony of Petropoulou, at 5-6.

⁶⁴ Pre-Filed Testimony of Tolson, at 2; Pre-Filed Testimony of Petropoulou, at 9; Oct. 19, 2010 Hearing, Testimony of Granato, at 273.

⁶⁵ Pre-Filed Testimony of Granato, at 6 (Aug. 4, 2008).

⁶⁶ *Id.*

⁶⁷ Pre-Filed Testimony of Tolson, at 6; Pre-Filed Testimony of Granato, at 5 (Aug. 4, 2008).

⁶⁸ Pre-Filed Testimony of Granato, at 5 (Aug. 4, 2008).

Disinfection of the effluent outfall was predicted to result in a decrease in effluent pathogen loads from the water reclamation plants but have little effect on overall pathogen concentrations in the waterway. This is because the sampling data shows that a large proportion of the pathogen load results from sources other than the plant effluent. Disinfection results in effluent pathogen risk decreasing from a low level to essentially zero from the water reclamation plants but has little impact in waterway pathogen concentrations affected by current or past wet weather conditions. Therefore, these results suggest that disinfection of effluent will have little impact on the overall illness rates from recreational use of the CAWS.⁶⁹

Even if disinfection would lower the fecal coliform levels in the CAWS, however, studies have found that there is no clear indication that pathogens would be significantly reduced through compliance with the disinfection requirements being proposed here by IEPA.⁷⁰ Dr. Blatchley “conducted research to address the specific implications of disinfection processes, as applied to municipal wastewater.”⁷¹ Based on his research and analysis, Dr. Blatchley testified that imposition of the IEPA-proposed standard “will yield minimal benefit to water quality in the CAWS, and minimal reduction in the risk of disease transmission.”⁷²

Dr. Blatchley based his conclusion that disinfection will only have a minimal benefit on several factors. First, Dr. Blatchley testified that:

The effluent limitation proposed by IEPA is based on measurements of the concentration of viable fecal coliform bacteria in the effluents of the District’s wastewater treatment facilities. Coliform bacteria are commonly used as indicator organisms in wastewater settings; however, there is considerable evidence to indicate that the use of coliforms as an indicator organism provides potentially misleading information regarding the performance of disinfection systems.⁷³

⁶⁹ Pre-Filed Testimony of Tolson, at 6; *see also* Pre-Filed Testimony of Tolson, Exhibit 1 (showing minimal effect of disinfection on predicted illnesses per 1,000 exposures).

⁷⁰ *Id.* at 7 (citing Blatchley et al., “Effects of Wastewater Disinfection on Waterborne Bacteria and Viruses,” 2007).

⁷¹ Pre-Filed Testimony of Blatchley, III, at 2 (Aug. 4, 2008).

⁷² *Id.* at 2-3.

⁷³ *Id.* at 3.

Dr. Blatchley also found that “[w]hile it is clear that chlorine- or UV-based disinfection will accomplish an immediate decrease in the concentration of viable bacteria, it appears that the long-term effects of chlorination/dechlorination or UV irradiation may actually be detrimental to water quality, in terms of bacterial composition.”⁷⁴ This conclusion was based on Blatchley’s finding that “[b]ecause viable and/or infective microorganisms will remain in the water post-disinfection, and because the microbial community will adapt to the post-disinfection environment, the population of microbes in disinfected water will change with time. Many microbes have the ability to repair sub-lethal damage, and therefore can recover post-disinfection. Repair and recovery will take place following any disinfection process.”⁷⁵

As a result, “in most countries of western Europe, wastewater disinfection is practiced only at facilities where effluent discharge is to a public swimming area, or where other opportunities for direct human contact are likely (*e.g.*, shellfish breeding grounds). Despite the fact that effluent disinfection is uncommon in Europe, the incidence of diseases associated with waterborne pathogens among the residents of these countries does not appear to be substantially different than in the U.S.”⁷⁶

Dr. Blatchley also testified that for disinfection to be effective, IEPA would have to require bacterial reductions that are much more stringent than its proposal, with accordingly greater costs.⁷⁷ Specifically, Dr. Blatchley testified that:

Disinfection systems used in wastewater reuse applications with potential of direct human contact, have been demonstrated to accomplish reliable, effective control of microbial pathogens; however, these systems call for roughly an order of magnitude greater disinfectant exposure than would be

⁷⁴ *Id.* at 5.

⁷⁵ *Id.*

⁷⁶ *Id.* at 6.

⁷⁷ See Sept. 23, 2008 Hearing, Testimony of Blatchley, at 131-132.

required to comply with the proposed effluent bacterial limitation for incidental (limited) human contact. The proposed effluent limit of 400 cfu/100 mL for coliform bacteria is modest, as the conditions of disinfectant exposure that will be required are unlikely to lead to effective control of microbial pathogens.”⁷⁸

Dr. Blatchley cited the example of “the conditions of disinfectant exposure that are mandated by *Title 22* of the California Administrative Code are roughly 10 times greater than those that are applied in conventional disinfection systems. These requirements are met through the use of reactors that are substantially larger than those that would be required for conventional disinfection, and with substantially greater quantities of disinfectant than would otherwise be required.”⁷⁹ Because IEPA has not proposed such a stringent effluent standard, disinfection in compliance with the Proposed Rule will not result in effective control of microbial pathogens.

Dr. Blatchley also found that “irrespective of the effluent disinfection constraints that are imposed on the District facilities, the potential for inputs of microbial pathogens from other sources will still remain.”⁸⁰ Specifically, Dr. Blatchley testified:

The system defined by the Tunnel and Reservoir Plan (TARP) has yielded substantial improvements in water quality within the CAWS. It is likely that additional water quality improvements will result from the completion of TARP. However, even when completed, this facility will not accomplish complete capture of wastewater from CSOs; therefore, CSO events will continue to take place in the Greater Chicago Area. Moreover, non-point source contributions to the CAWS will be largely unaffected by TARP.⁸¹

As a result of his research and analysis for this case, Blatchley concluded that “[c]ollectively, these issues dictate that wastewater disinfection, as required to comply with the proposed

⁷⁸ *Id.* at 9.

⁷⁹ *Id.* at 6.

⁸⁰ *Id.* at 7 (“However, it is also clear that water quality in the CAWS will be influenced by inputs from other sources, including combined sewer overflows (CSOs) and non-point sources.”).

⁸¹ *Id.*

effluent bacterial limit, will yield little or no decrease in the risk of disease transmission associated with use of the CAWS.”⁸²

The CHEERS Report also makes it clear that disinfection is not necessary to support the uses proposed for the CAWS. The risk to recreators in the CAWS, where effluents are not disinfected, are no greater than the risks to recreators in other nearby waters where effluents are disinfected or where no effluent is discharged.⁸³ As a result, disinfection will provide no public health benefit.⁸⁴

II. Disinfection is Not Economically Reasonable Where No Human Health Benefit Will Result

It is essential that the microbial standards for water be reasonably and adequately protective of human health in light of the substantial capital expenditure that may be required to bring the CAWS into regulatory compliance.⁸⁵ Even if it were clearly necessary to support the recreational uses proposed for the CAWS—which it is not—the Board should adopt the Proposed Rule only if it finds that the disinfection requirement is economically reasonable.⁸⁶ As instructed by the Illinois Supreme Court, the Board must “use its technical expertise and judgment in balancing any hardship that the regulations may cause to dischargers against its statutorily mandated purpose and function of protecting our environment and public health.”⁸⁷

⁸² *Id.* at 10.

⁸³ Pre-Filed Testimony of Granato, at 5 (Sept. 20, 2010).

⁸⁴ *Id.* Disinfection becomes particularly unnecessary when viewed in the context of impending nutrient removal requirements, which the District will likely face in the near term. The least stringent level of nutrient control is likely to be 0.5 mg/L for total phosphorus and 6-8 mg/L for total nitrogen. At these levels, indicator microorganisms in the District effluent will be lower as a result of plant expansion required to achieve nutrient removal. *See* District’s Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Item 7F, at 1 (Jan. 3, 2011).

⁸⁵ Pre-Filed Testimony of Granato, at 6-7 (Aug. 4, 2008).

⁸⁶ *See, e.g.,* Phosphorus Order (“An effluent standard is mainly intended to limit significant loading of a pollutant to a receiving stream giving consideration to availability of appropriate treatment technology and associated costs.”).

⁸⁷ *Granite City Division of National Steel Co. v. IPCB*, 155 Ill. 2d 149, 183, 613 N.E.2d 719, 734-35 (1993).

Because the Proposed Rule is not necessary to protect human health and support the recreational uses proposed for the CAWS, its substantial costs—both monetary and environmental—are not justified under the Act.

A. Disinfection Will Require Enormous Capital and Operational Costs for the District

The costs associated with disinfection are extraordinary, particularly considering the limited benefit. For example, installation and operation of ultraviolet (UV) disinfection technology, which currently represents the most likely choice for implementation at the District's North Side, Calumet and Stickney plants, is estimated at a 20-year present worth cost of \$919.6 million.⁸⁸ Disinfection with chlorination and dechlorination rather than UV would result in similar costs.⁸⁹

The current value of \$919.6 million, however, is likely very conservative, representing the low end of the range of possible disinfection costs. This estimate was based on the District's initial judgment that it could meet the proposed standard without including filtration systems. However, if filtration is necessary, it would add significantly to the overall disinfection costs:

MS. ALEXANDER: Could you please show me in here [an AE Com report] where the \$2 billion figure is supported?

DR. GRANATO: Well, I would go to table 1.26, and added up at the bottom of the table there's, "Total present worth, in millions, costs for north side Stickney, Calumet," and it comes to over \$2 billion if you add up those costs.

MS. ALEXANDER: And just to clarify, table 1.26 is for UV with filtration. Is that correct?

DR. GRANATO: Yes, that's correct.

⁸⁸ Pre-Filed Testimony of Zenz, at 9 (Aug. 4, 2008); Pre-Filed Testimony of Granato, at 7 (Aug. 4, 2008); Pre-Filed Testimony of Granato, at 5 (Sept. 20, 2010).

⁸⁹ Pre-Filed Testimony of Granato, at 7 (Aug. 4, 2008); Pre-Filed Testimony of Granato, at 5 (Sept. 20, 2010).

MR. ANDES: So is it correct, Dr. Granato, just to clarify, when you're talking about the \$2 billion between UV and ozone you're actually – you're picking the UV numbers of \$379 million, \$1,326,000,000 and \$448 million.

DR. GRANATO: That's correct.

MR. ANDES: And at least my addition comes up to \$2.153 billion for that. Does that sound right?

DR. GRANATO: That sounds right.⁹⁰

The District's estimate of costs associated with installation and operation of disinfection equipment has not been rebutted by IEPA or any other party in the rulemaking, so is undisputed. In 2006, U.S. EPA provided comments criticizing those estimates. U.S. EPA, however, has never provided evidence in this rulemaking, however, and as Dr. Zenz has testified, those criticisms were without merit:

I'm not going to give you all the nuts and bolts, but there were three major comments which came out of this USEPA review of our Level 4 cost estimates, and of course when we got this new contract with the District, the Level 3 cost estimate, we wanted to make sure that we were cognizant of these comments from USEPA and that we reviewed them carefully, and the first comment they made was they said they were very skeptical that tertiary treatment may not be needed, and you'll recall from my testimony that we actually had a Level 4 cost estimate. We presented costs for UV disinfection plus filtration, and UV disinfection without filtration. So the comment was why, you know, they questioned the need for tertiary filtration as an additive process to UV disinfection.

Well, when we began our Level 3 cost estimate, we decided that we needed more data on turbidity of the waters at three major plants. We did our Level 3 cost estimate, and we did very little work on this area, and based on this more recent data, we concluded that actually tertiary filtration did not appear to be necessary. And actually, if you look at our cost estimates that are in my testimony, those cost estimates do not include tertiary filtration. But however, we must say the final decision should be made during preliminary design based on additional sampling, including the pilot plant study which we recommend. So obviously we feel that the additional data indicates the issue of filtration is something we think is probably not necessary. Again, this points to the need for a pilot plant.

⁹⁰ Oct. 20, 2010 Hearing, Testimony of Granato, at 13-14.

Next issue that they brought up, and they said, "Why are you providing pump stations in combination with each of the UV disinfection facilities?" So we did, at the request of the District, more detailed hydraulic analysis than we originally did for our Level 4 cost estimate. And based on this more extensive review of the hydraulics of each plant, we concluded exactly the same thing as we have done before. We feel that a pumping station is used at each of the three stations. It is necessary to -- in order to get the water through a UV disinfection facility with the number of bulbs and hydraulic resistance of the facility and supporting structures that you would need a pumping station.

Lastly, one of the major comments they made is, "Why are you putting your UV disinfection facility in a building," and they felt that it could be out in the open. It didn't necessarily have to -- did not have to be in a building. We reviewed this issue quite extensively, and I can give you more detail about it. It's going to take a little time, but if you want to go through it I can do it.

Well, if we haven't all realized, these are huge facilities, and there's going to be multiple maintenance activities that would be required to replace the lamps on the periodic basis. Both lamps -- slowly, UV lamps slowly lose their ability to produce UV rays, and they have to be periodically replaced whether they burn out or not, and then other lamps just burn out. So they have to be replaced, you have to inspect the leads, there's going to be some -- although we included in our cost estimate an automatic bulb cleaning system based upon surveys that we did, telephone surveys, other facilities that have online cleaning systems -- inline cleaning systems, but they still practice manual cleaning, and we felt that was going to be necessary.

If you look at the cost estimates, the costs are in millions, and there's sensitive electrical equipment. And considering weather patterns in this area, we think having it in the building is necessary. And by the way, there are UV systems in the local area, which are enclosed. The Village of Hanover Park, for example, which I worked at, even though it's a small facility, the UV facility is enclosed. The Glenbard Wastewater Treatment Plant, the Racine Water Facility, among others, are all enclosed indoors. So we disagree with them, so our cost estimate includes a building.⁹¹

Imposition of the exorbitant costs that would result from the Proposed Rule would require extraordinary measures to approve funding, or could have significant adverse effects on

⁹¹ Oct. 27, 2008 Hearing, Testimony of Zenz, at 81-86.

the District's ability to fund other initiatives. Based on the District's limitations and restrictions on generating revenues to fund programs, funding disinfection would require legislative action, a voter referendum, or significant reductions in funding the District's existing capital improvement plan, which is designed to maintain and upgrade the District's aging infrastructure.⁹²

Mr. Kunetz provided additional details concerning the likely effects of having to fund such an expensive process on the District's existing obligations:

The District maintains a Capital Improvements Program to identify, plan for, and allocate funds for the projects necessary to repair, rehabilitate, replace, and expand the infrastructure of the water reclamation plants. Project needs are identified through facility planning studies, which are put into a Master Plan, or on a routine basis by District staff. The total projected estimated capital cost for the Master Plan projects at the District's three largest plants is \$2,411,670,000. These costs do not include potential project costs for future Master Plan projects at the Egan, Kirie, and Hanover Park water reclamation plants for which Master Plans as of yet have not been developed. The total projected estimated capital cost for non-master plan capital projects at all seven water reclamation plants is \$407,800,000. The sum of the above costs is \$2,819,470,000. This represents the baseline financial obligations of the District necessary to keep the water reclamation plants functioning under the current regulatory framework through the year 2040 planning horizon. Costs for infrastructure that would be required to comply with new regulatory standards would be above and beyond this baseline.

Failure to accomplish these capital improvements projects will jeopardize the District's water reclamation plants' ability to continue to produce exceptional quality wastewater, will potentially impede the water reclamation plants' ability to meet the existing NPDES permit effluent discharge limitations as flows and loads increase, and will allow aging infrastructure to further degrade to the point that it is beyond reasonable repair or use.⁹³

Mr. Mastracchio used the estimates developed by Dr. Zenz, and explained further the overall funding problems that could result if the District is required to disinfect its effluent to

⁹² Pre-Filed Testimony of Granato, at 7-8 (Aug. 4, 2008); Pre-Filed Testimony of Granato, at 5 (Sept. 20, 2010).

⁹³ Pre-Filed Testimony of Kunetz, at 6-7 (Aug. 4, 2008).

meet the proposed bacterial effluent standard.⁹⁴ Mr. Mastracchio explained that the District “generates revenue to fund its operations through an ad valorem property tax, a personal property replacement tax, user charges, interest income, and other miscellaneous fees and charges.”⁹⁵ He described “several financial limitations and restrictions that directly impact [the District’s] ability to take on additional projects or programs” as follows:

First, in 1995, the Property Tax Extension Limitation Law was passed by the Illinois General Assembly, which limits the ability of the District to adopt future increases in the aggregate tax levy. In accordance with this Act, increases to the District’s property tax levy are limited to the lesser of: (1) five percent or (2) the change in the national consumer price index plus allowable increases for new property. The aggregate levy is the total levy of all funds except the Bond Redemption and Interest Fund and the Stormwater Management Funds. In other words, debt service and stormwater management costs are not included under this limitation.

Second, the District’s initial Tax Cap legislation restricted the District’s non-referendum bond authority to only apply to projects initiated prior to October 1, 1991. There was a specific exemption, essentially to exclude Tunnel and Reservoir Plan projects from the more restrictive provisions of the Act which require referendum approval of all new debt. Public Act 89-385 provides the District with the authority to issue non-referendum “limited bonds” for capital projects initiated after October 1, 1991 at the same debt service level as it did in 1994. Limited bonds can be issued to the extent that the total debt service requirements of any new debt, when combined with existing debt service, does not exceed the 1994 debt service extension base of \$141,463,920. Public Act 90-485 has provided a further modification by authorizing the exclusion of debt for Tunnel and Reservoir Plan projects from this debt service extension base.

Third, in 2003, the District received authority under Public Act 93-279 to issue \$150 million (previously \$100 million) of non-referendum bonds during any budget year plus authorized, but unissued bonds, during the previous three budget years through 2016.⁹⁶

⁹⁴ Pre-Filed Testimony of Mastracchio, at 2 (Aug. 4, 2008).

⁹⁵ *Id.* at 3.

⁹⁶ *Id.* at 3-4.

After reviewing the baseline financial obligations outlined by Mr. Kunetz, Mr. Mastracchio concluded that adding disinfection to existing obligations would exceed the District's current financial capability:

...the District does not have sufficient financial resources to fund the capital expenditures and operation and maintenance costs necessary to disinfect its discharges to meet the IEPA proposed bacterial effluent standard, either through chlorination and dechlorination or through ultraviolet disinfection. The District cannot generate sufficient revenues within the constraints of the Property Tax Extension Limitation Act, and the remaining funds needed would exceed the District's Tax Cap and non-referendum bonding authority.⁹⁷

This conclusion was confirmed during the District's analysis of the likely impacts of compliance with the Proposed Rule, in response to Board questions. The District concluded that imposition of UV disinfection, without filtration, would result in increased tax levies of over 15 percent.⁹⁸ User charge rates for industrial and tax exempt users would increase approximately 8 percent.⁹⁹ Adding filtration would increase taxes by over 40 percent, and user charges by approximately 10 percent.¹⁰⁰ Considered in the context of all future District obligations, including the proposed dissolved oxygen standards and nutrient control (at the less stringent of two potential control levels that were analyzed), taxes would have to increase by over 115 percent, and user charges would increase by approximately 61 percent.¹⁰¹

Mr. Mastracchio provided the following conclusions concerning the financial effects of disinfection, if required by the Proposed Rule:

Full funding of the activities necessary to achieve compliance with IEPA's proposed rule would require an act of the state Legislature to amend the

⁹⁷ *Id.* at 4-5, Attachments 4 & 5.

⁹⁸ District's Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Item 5, at 1 (Jan. 3, 2011).

⁹⁹ *Id.*, Item 6, at 2.

¹⁰⁰ *Id.*, Item 6, at 2; Item 7D, at 3,

¹⁰¹ *Id.*, Item 6, at 4; Item 7D, at 4.

Property Tax Extension Limitation Act and provide additional non-referendum bonding authority; a voter referendum in support of additional bonding authority; or drastic reductions in the funding of other District programs. Furthermore, if implemented, disinfection would leave no financial capacity to fund other programs not currently included in the District's capital plan. One such project not currently included in the District's capital plan is nutrient removal facilities at its treatment plants, which could cost approximately \$2.8 billion if nutrient effluent limits are imposed in the future.¹⁰²

In light of the evidence presented by Mr. Mastracchio, Mr. Kunez, Dr. Zenz, and Dr. Granato, the District has demonstrated that the costs of implementing disinfection as required by the Proposed Rule would be wholly unreasonable. The District concluded that it does not have the financial resources to comply with the Proposed Rule:

Under the second alternative where ultraviolet disinfection and dissolved oxygen costs are included as part of the District's financial obligations, it is anticipated that the District will not have sufficient financial resources to fund the estimated capital expenditures and anticipated O&M costs. Under this alternative, the District cannot generate sufficient revenues within the constraints of the District's Tax Cap beginning in 2021. In addition, the District's debt financing needs would exceed its non-referendum bonding authority beginning in 2015, and its debt service extension limitation beginning in 2015.¹⁰³

This lack of financial capability will only be exacerbated when the District is required to implement nutrient removal.¹⁰⁴ The District summarized the funding issues as follows:

Given its financial limitations, the District does not have the financial capability to fully fund the projects and activities necessary to comply with IEPA's proposed rule. If the District was to implement nutrient removal along with incurring costs associated with ultraviolet disinfection and dissolved oxygen, the District's financial limitations would be exceeded even further. Furthermore, even if the tax cap limitation, non-referendum bonding authority and debt service extension base limitations were lifted to allow the District to finance and generate sufficient revenues

¹⁰² Pre-Filed Testimony of Mastracchio, at 5 (Aug. 4, 2008).

¹⁰³ District's Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Item 7E, at 4-5 (Jan. 3, 2011).

¹⁰⁴ Pre-Filed Testimony of Mastracchio, at 5 (Aug. 4, 2008); District's Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Item 7E, at 5 (Jan. 3, 2011).

to pay for the facilities, pronounced increases in the tax rate would be needed to pay for the facilities.¹⁰⁵

The costs of disinfection are even more unreasonable considering the relatively small number of beneficiaries who—although they would not be subject to lower health risks—might “feel better.”¹⁰⁶ CHEERS data obtained from field interviews of study participants demonstrated that 93 frequent users (out of a total of 3,893 CAWS users) accounted for approximately 49 percent of total CAWS use.¹⁰⁷ Thus, a very small number of users account for a relatively large proportion of uses.¹⁰⁸

IEPA argues that the Board should reach the same conclusion that it did during the phosphorus rulemaking—that the effluent standard is economically reasonable and should be adopted.¹⁰⁹ In that case, however, the Board cited two factors that are not present here in determining that the interim phosphorus effluent standard would not impose an undue economic or regulatory burden. First, applicability of the phosphorus standard was limited to new or expanding facilities over a certain size where phosphorus was the limiting nutrient, which the Board considered reasonable because those facilities would have the opportunity to incorporate the additional costs of phosphorus control into their overall expansion plans.¹¹⁰ Second, the Board determined that “it is prudent to control phosphorus discharge from larger treatment plants

¹⁰⁵ District’s Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Item 7E, at 6 (Jan. 3, 2011).

¹⁰⁶ May 6, 2009 Hearing, Testimony of Bamonte, at 71-72 (“I would feel much better paddling in CAWS” with disinfection). Cf. Oct. 5, 2009 Hearing, Testimony of Crivello, at 52 (“MR. ANDES: But since you’ve recreated in these waters at least three times a month, you don’t believe they’re personally unsafe? MR. CRIVELLO: No, not for incidental contact, you know.”)

¹⁰⁷ See Oct. 19, 2010 Hearing, Testimony of Dorevitch, at 109-110; see also Exhibit 402 on Board Docket (Table – Percent of CAWS Uses Among CHEERS Study Participants, by Categories of User Frequency in the Past 12 Months).

¹⁰⁸ Pre-Filed Testimony of Dorevitch, at 5 (Sept. 20, 2010).

¹⁰⁹ See IEPA Resp. at 7.

¹¹⁰ Phosphorus Order, at 3.

given the impact of such discharges on receiving streams.”¹¹¹ Neither of these factors is present here. The Proposed Rule is not limited in applicability, but would require all facilities to disinfect to meet the bacterial effluent standard. In addition, here there is no demonstrated impact here that would justify Board action to require disinfection. Existing bacteria levels have been empirically demonstrated to be unrelated to risks associated with recreation on the CAWS, and it is clear from the District studies that there would be no public health benefit from disinfection. As a result, disinfection is not necessary to protect the proposed recreational uses, and the extreme economic costs outweigh any possible benefit and should be considered unreasonable.

B. Disinfection Will Cause Adverse Environmental Effects that Clearly Outweigh Any Benefits

In addition to monetary costs, it is appropriate for the Board to consider the significant adverse environmental impacts that make adoption of a disinfection requirement economically unreasonable. The District has demonstrated that operation of disinfection processes would result in substantial adverse environmental impacts that the Board should consider, in the form of energy usage, air emissions from power generation and transportation of raw and waste materials, and land usage.¹¹² This conclusion was based on the analyses conducted by Mr. McGowan, who provided the Board with an evaluation of the overall environmental impacts of implementing disinfection at the District plants. Specifically, Mr. McGowan found that the following activities would adversely affect air quality:

- (1) Energy consumption and associated air emissions during operation of the UV or chlorination/dechlorination equipment and sodium hypochlorite manufacturing;
- (2) Energy consumption and associated air emissions during the operation of the UV or chlorination/dechlorination low lift

¹¹¹ *Id.* at 4.

¹¹² Pre-Filed Testimony of Granato, at 5 (Sept. 20, 2010).

pumping station; (3) Air emissions as a result of the increased traffic from construction, maintenance/operation, and deliveries; and (4) Noise associated with the construction and operation of the facilities.¹¹³

In addition, Mr. McGowan concluded that water requirements for facilities during construction and operation and stormwater runoff from disinfection facilities would adversely impact water quality.¹¹⁴ Finally, adverse environmental impacts would result from land usage:

(1) Land requirements for each facility; (2) Modifications to the land during construction such as reduction of open space and additional impervious area; (3) Landfill needs for disposal of UV equipment or mercury; and (4) Reduction of available space for future expansions.¹¹⁵

If UV radiation is the chosen technology for disinfection, McGowan indicated that the District's electricity use would increase substantially, resulting in emissions of 85,500 tons of carbon dioxide equivalents of greenhouse gases per year.¹¹⁶ In addition, he described further environmental impacts as follows:

Ultraviolet Radiation will:

- Result in emissions of 180 tons of NO_x per year; 650 tons of SO₂ per year; 6 pounds Hg per year at the power generating facility due to operation of the UV equipment and operation of the low lift pumping station.
- Require 7.5 acres of District land to be converted to an industrial plant from current or allocated uses; this land will not be available for future expansions (5 acres will become impervious area).
- Require 1,500-3,000 cubic feet at the landfill upon disposal at the end of its useful life.

¹¹³ Pre-Filed Testimony of McGowan, at 5-6 (Aug. 4, 2008).

¹¹⁴ *Id.* at 6.

¹¹⁵ *Id.*

¹¹⁶ *See* Mar. 3, 2009 Hearing, Testimony of McGowan, at 212-215; *see also* Exhibit 215 on Board Docket (Table – Comparison of GHG Emission Estimates Based on Original and Updated Emission Factors).

- Increase stormwater runoff volume by 5 MG per year.¹¹⁷

The significant costs, adverse economic impacts, and adverse environmental impacts should be balanced against the lack of any public health benefit that would result from disinfection, as required by the Act.¹¹⁸ As a result, the Board should decline to adopt the Proposed Rule.

III. Appropriate Bacterial Requirements for the CAWS

The District believes that the Agency should use the results of the CHEERS study to develop appropriate, science-based requirements to protect recreational uses on the CAWS.¹¹⁹ The CHEERS Report and Supplement conclude that there is no support for a disinfection requirement, and no relationship between levels of bacterial parameters in the CAWS and risk of illness. Therefore, there is no technical basis to develop numeric water quality standards for those parameters based on protection of recreational uses.

The District has provided an alternative approach that is supported by the results of the CHEERS Report and Supplement.¹²⁰ This approach would not establish a bacterial effluent standard or require disinfection, which is not necessary to support the uses proposed for the CAWS, but instead would establish narrative criteria. These criteria would provide that the levels of pathogen indicators shall not result in impairment of the designated uses, and specific requirements would be added that will help maintain compliance with those standards.¹²¹ For the District facilities, these requirements would provide that the plants will comply with all

¹¹⁷ *Id.*

¹¹⁸ 415 ILCS 5/27(a); *Granite City Division of National Steel Co. v. IPCB*, 155 Ill. 2d 149, 183, 613 N.E.2d 719, 734-35 (1993).

¹¹⁹ Pre-Filed Testimony of Granato, at 2 (Sept. 20, 2010).

¹²⁰ District's Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Item 8, at 1 (Jan. 3, 2011).

¹²¹ *Id.*

provisions included in their NPDES permits, including total suspended solids limits (which help reduce bacteria levels by removing solids that the bacteria are attached to) and operation and maintenance provisions (which ensure that the District continues to operate all of the advanced treatment systems that are currently specified in the permits).¹²² For wet weather sources, compliance with approved Long Term CSO Control Plans and other applicable requirements will be specified.¹²³ These provisions would ensure continued protection of applicable recreational uses for all reaches of the CAWS.¹²⁴

IV. Conclusion

The District has empirically demonstrated that disinfection is not necessary to protect public health or support the uses proposed for the CAWS, and in fact would provide no demonstrable human health benefit at all. The significant costs, adverse economic impacts, and adverse environmental impacts to air, water, and land that would result from imposing disinfection requirements on the District facilities outweighs any possible benefits. As a result, the Board should decline to adopt the Proposed Rule, because it is unnecessary and economically unreasonable under the Act.¹²⁵ Instead, the Board should adopt the narrative requirements proposed by the District to protect the recreational uses on the CAWS.

¹²² *Id.*

¹²³ *Id.*

¹²⁴ District's Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Item 10, at 1 (Jan. 3, 2011).

¹²⁵ If the Board chooses to adopt the Proposed Rule, the District would request a compliance date beyond the March 1, 2011 date initially proposed by IEPA. The equipment necessary to disinfect flows at District facilities and comply with the effluent bacteria standard must go through design, bid, construction, and startup processes, which are not feasible to complete in such a short time frame.

Dated: January 3, 2011

**METROPOLITAN WATER RECLAMATION
DISTRICT OF GREATER CHICAGO**

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