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 15th day of February, 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 Reply to Comments on the Proposed Effluent Bacteria Standards.**

Dated: February 15, 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 Reply to 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 15th day of February, 2011, upon the attorneys of record on the attached Service List.

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METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO'S REPLY TO 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 reply to comments on Proposed Rule 35 Ill. Admin. Code § 304.224 (the "Proposed Rule"), which would establish effluent bacteria standards for discharges to the Chicago Area Waterway System ("CAWS") and Lower Des Plains River ("LDPR").

Environmental groups including Natural Resources Defense Council, Environmental Law & Policy Center, Friends of the Chicago River, Openlands, Alliance for the Great Lakes, Prairie Rivers Network, and Sierra Club-Illinois Chapter (the "Environmental Groups") filed a response to the District's comments on the Proposed Rule on January 31, 2011. In addition, the U.S. Environmental Protection Agency ("U.S. EPA") provided comments to the Board concerning the Chicago Health, Environmental Exposure, and Recreation Study ("CHEERS"). These documents seek to attack the CHEERS Report and Supplement, criticize the District's cost estimates, and raise a few other miscellaneous issues, which are addressed below. However, nothing in the record before the Board—including the issues raised by the Environmental Groups and U.S. EPA—demonstrates that disinfection is necessary to protect the recreational uses of the CAWS, or that disinfection is economically reasonable in light of the minimal benefits it could

provide. As a result, the statutory requirements for promulgation of effluent standards have not been met, and the Board should decline to adopt the Proposed Rule. Instead, the Board should consider adopting the District's alternative proposal, which protects the recreational uses and complies fully with Federal and State law.

STANDARD OF REVIEW

The Environmental Groups continue to assert that unless disinfection is demonstrated to cause widespread social and economic impact in accordance with federal use attainability analysis ("UAA") requirements, the Proposed Rule should be adopted. This assertion is incorrect. Federal Clean Water Act ("CWA") rules requiring a demonstration of social and economic impact apply only to modifications of currently applicable designated uses or water quality criteria. The Proposed Rule is neither. Instead, the Proposed Rule is a new effluent standard that would require disinfection at the District facilities, and should be adopted only if it is affirmatively demonstrated to be necessary to prevent pollution that would render the CAWS "harmful or detrimental or injurious to public health, safety or welfare," and only after consideration of its economic reasonableness.[1]

DISCUSSION

Nothing the Environmental Groups or U.S. EPA have provided demonstrates that the Proposed Rule is necessary to prevent pollution that would be detrimental to public health, or

[1] 415 ILCS 5/13(a) (Board may adopt regulations, including effluent standards, to promote the purposes of the Illinois Environmental Protection Act (the "Act")); 415 ILCS 5/11(b) (Purpose of Act to assure that no contaminants are discharged into waters of the State without being given the degree of treatment or control "necessary to prevent pollution"); 415 ILCS 5/3.545 ("Water pollution" includes "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…"); 415 ILCS 5/27(a) ("In promulgating regulations under this Act, the Board shall take into account…the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution.").

that disinfection is economically reasonable in light of its minimal benefits.[2] The most recent comments focus primarily on criticism of CHEERS. For purposes of determining whether to adopt the Proposed Rule, however, the Board must consider whether anything in CHEERS—or elsewhere in the record—demonstrates that CAWS recreators are subject to significant health risks from exposure to secondary treated undisinfected effluent, such that the Proposed Rule is necessary under state law.

Regardless of the parties' criticisms of CHEERS, no such demonstration has been made. On the contrary, the District has presented sufficient evidence to demonstrate that disinfection is clearly not necessary to support the uses of CAWS. CHEERS provides the only direct means of comparing the risks from recreating in waters that receive no undisinfected effluent to the risks from recreating in the CAWS. Although both the CAWS and general use waters may contain bacteria or pathogens from point and nonpoint sources, the primary difference between the two types of waters is the discharge of secondary treated undisinfected effluent. That difference has no significant effect on health risks from secondary recreation activities.

In addition, nothing in CHEERS supports the assertion that the overall risks from bacterial or pathogen exposure in the CAWS are at a level that would justify disinfection at the District facilities. CHEERS measured the risks of acute gastrointestinal illness from all causes, rather than only bacterial or pathogen exposure, and found approximately 12.5 illnesses per 1,000 uses – almost identical (actually, a bit lower than) the illness rate in other area waters. No association was demonstrated between those illnesses and bacterial exposure in the CAWS. Because no significant health risks are associated with exposure to secondary treated

[2] Nor is disinfection otherwise required by the Illinois regulation governing protected waters. The District addressed this issue directly in its previous filings. *See* District's Responses to Information Requests at October 19 and 20, 2010 Hearings, Item 4 (Jan. 3, 2011). Even the Environmental Groups acknowledge that such requirements would apply only if CAWS waters were classified as General Use waters. Environmental Groups' Response, at 6. They are not designated as General Use waters or proposed for General Use designation, so disinfection is not required.

undisinfected effluent in the CAWS, disinfection would provide only minimal health benefits, at best, and is not necessary under Illinois law.

The Environmental Groups and U.S. EPA also raised issues concerning the validity of the District's cost estimates. It is undisputed, however, that the disinfection that would be required by the Proposed Rule would impose hundreds of millions of dollars in costs on the District and the Cook County residents and businesses whose taxes and user fees support District operations. The Board must consider whether those costs are economically reasonable when balanced against the minimal benefits that could be gained if disinfection is required. Nothing presented by the parties demonstrates a significant public health benefit that would justify such enormous costs.

I. The Proposed Rule Is Not Necessary

The issues raised by the Environmental Groups and U.S. EPA do not demonstrate that the Proposed Rule—or the disinfection it would require—are necessary under Illinois law. Each of the issues, primarily aimed at criticizing CHEERS, is summarized and addressed below. None of those criticisms, however, diminishes the power of CHEERS or the validity of its conclusions. Recreational users of the CAWS do not suffer significant health risks resulting from exposure to secondary treated undisinfected effluent. In addition, the health risks that do exist are not associated with bacterial exposure. Therefore, disinfection is not necessary, and would provide minimal—if any—public health benefit.

The U.S. EPA and the Environmental Groups make much of a few critical comments made by peer reviewers regarding certain aspects of the CHEERS report. However, they both entirely fail to acknowledge the significant positive comments by peer reviewers that confirmed the CHEERS study's strengths:

- "**A very comprehensive assessment of the health risks associated with secondary contact recreation exposure.** Investigators successfully conducted a very complex assessment of microbial parameters and associated health implications for populations using waters for recreation. Study looked at a number of different types of illnesses that could be associated with recreational exposure, not just gastrointestinal effects and actually took stool samples and analyzed them for possible pathogens of concern for the illnesses detected and this is really a first for waterborne illnesses in recreational settings. The research team was very professional and open to suggestions for improving the study and was willing to make changes even in midcourse. **The study was very well thought out and used state-of-the-art approaches to epidemiological assessment**." CHEERS Report, Appx. D, at D-1 (emphasis added).

- "The recruitment and interviewing aspects of the study were well-designed, effectively executed, and achieved all intended goals. Response rates were substantial and impressive." *Id.*

- "A great job by a great team of investigators and support staff. This report will be very useful to other researchers and governmental teams that will be working toward improved protection of recreational water users around the country." *Id.*

- "Enrollment and follow up, questionnaire data, general study design and implementation was highly successful." *Id.*

- "**Strengths of this research include the experimental design, the quality of the analytical data and comprehensiveness of the investigation**. The attention to data quality by the research team was evident with the scrutiny with which contract lab data were subjected, the training of the field sampling staff and the QC checks that were in place. **The comprehensiveness of this investigation is evidenced by the statistical rigor used which includes looking at data using various tools, breath of pathogens monitored and of course the clinical portion of this study.**" *Id.* (emphasis added).

As to its replies to the numerous points raised in the U.S. EPA and Environmental Groups' responses, the District states as follows.

U.S. EPA's Response Comments[3]	**The District's Reply**
U.S. EPA argues that the CHEERS report is limited in scope because it did not include activities such as swimming, wading, jet skiing, tubing or waterskiing. U.S. EPA Resp., at 1.	IEPA is not proposing to protect primary contact uses such as swimming, wading, jet skiing, tubing or waterskiing in the CAWS. Instead, IEPA's proposal is to protect secondary contact uses. This comment was addressed by Dr. Dorevitch in the document "Clarifications about CHEERS in Response to the USEPA's December 27, 2010 Filing," which was filed with the Board on January 3, 2011. In that filing Dr. Dorevitch stated "[f]irst, these activities are rare – no swimming was ever observed, and the jet skiing, water skiing, tubing, and wading combined accounted for less than 1% of observed uses. The fact that these activities were so rare means that estimating illness rates for these activities would likely lead to misleading results." *Id.* at 2. Moreover, Dr. Dorevitch confirmed "[s]peculating about future risk levels was not an objective of the study." *Id.* Also, it is simply unsafe for CAWS users to be engaged in these activities in the CAWS, and it would be irresponsible to encourage such uses in the CAWS.
U.S. EPA argues that "known point source discharges and combined sewer overflows (CSOs), as well as backflows of water from the CAWS to Lake Michigan, are all potential sources of human fecal contamination to GUW." Accordingly, "EPA does not agree with Dr. Dorevitch's assertion that it is 'entirely reasonable to compare rates' of illness between CAWS and GUW user groups." U.S. EPA Resp., at 2.	U.S. EPA's argument makes the District's point. Specifically, the CAWS, like the GUW waters, has point sources and CSOs, and, thus, they are comparable waters that Dr. Dorevitch properly relied on for the CHEERS report.

[3] U.S. EPA's Response Comments are taken from the "EPA Comments to Illinois Pollution Control Board Docket R2008-009 (Subdocket B) Regarding Information Provided the Illinois Pollution Control Board in Public Comments 562 and 565," filed on January 31, 2011.

U.S. EPA argues that the CHEERS methodology was flawed because there was "minimal reporting of what the relative fecal source attributions were for each day of the epidemiological study," and then provides information related to previous epidemiological studies that purportedly show better methodologies. U.S. EPA Resp., at 2-3.	The CHEERS protocols were based on the U.S. EPA's own National Environmental and Epidemiological Assessment of Recreational Water ("NEEAR") study, so it is unclear why U.S. EPA would question Dr. Dorevitch's use of its own approved epidemiological protocols. Moreover, U.S. EPA repeatedly cites protocols from epidemiological studies by T.J. Wade. U.S. EPA Resp., at 2. U.S. EPA, however, ignores that Dr. Wade is on the peer-review panel for the CHEERS report and was part of the process that approved the CHEERS protocols. CHEERS Report, Acknowledgements, at iii.
U.S. EPA asserts that "given the suggested sewage impact within both the CAWS and GUW sites and given that a large number of epidemiological studies previously undertaken on sewage-impacted waters found about 11 illnesses per 1000 recreators in freshwaters, the fact that similar levels of illness were reported for both groups of recreational sites in the CHEERS study is not, in retrospect, unexpected." U.S. EPA Resp., at 3-4	The District concurs with U.S. EPA's conclusion that similar levels of illness were reported for recreators in the CAWS and GUW waters. In fact, the U.S. EPA's conclusion that the similar levels of illnesses in both groups is not unexpected directly conflicts with the comments of the Environmental Groups, who argue that the CHEERS study is fundamentally flawed in numerous respects and that its conclusions are suspect. U.S. EPA's assertion that they would expect illness rates to be similar in waters receiving disinfected secondary treatment effluents and in waters receiving undisinfected secondary treated effluents supports the District's conclusions that imposing the IEPA proposed effluent disinfection standard would have very little public health benefit, and is not necessary under Illinois law.
U.S. EPA argues that "[g]iven the weight of evidence for sewage impact into GUW sites, the 22 potential differences studied were not useful. Rather, basic environmental health data on fecal sewage as raised above should have been better studied and incorporated into the CHEERS study final report." U.S. EPA Resp., at 4. U.S. EPA also asserts that "[a]s noted in Appendix D, a peer review commenter raised a similar issue with regard to the lack	As to U.S. EPA's comment that the 22 differences studied were not useful, that comment has no basis. Various parties have asserted that the CHEERS study did not properly analyze differences between the CAWS and GUW. Dr. Dorevitch responded and analyzed 22 differences, yet U.S. EPA summarily dismisses those analyses without any explanation of why "sewage impact into GUW sites" would make Dr. Dorevitch's detailed statistical analysis "not useful." In addition, U.S. EPA misinterprets the Appendix D peer review comment. The peer review statement was based on speculation with no substantiating facts. For example, the reviewer stated "[t]he inability to detect differences in illness from secondary exposure to CAWS vs. general use water bodies **may be** due to the **limitation of the epidemiological tools available today** or indeed there **may be no difference in**

of difference between CAWS and GUW illness rates." U.S. EPA Resp., at 4.	**pathogen loads between the two systems**." CHEERS Report, Appx. D, at D-2 (emphasis added). The same review also added that the CHEERS report tried to tease out differences by examining covariates in the recreator populations of user groups. The reviewer acknowledged that "there is no reason to believe that the population differences in the CHEER study would be different from other **epi studies (maybe other studies did not obtain some of the data that was obtained in the CHEERS questionnaire**) of recreational illness," and questioned "the assumption that pathogen loading is different between the GUW (with combined sewers) and the CAWS." *Id.* (emphasis added).
U.S. EPA asserts that the stool sample analysis in the CHEERS report was flawed because "too few samples were collected given the rate of infection and the likelihood of stool detection from such samples when compared to the expected background in the unexposed community." U.S. EPA Resp., at 5. U.S. EPA also raises the issue that a peer reviewer thought the stool sample results were not conclusive and should not be in the executive summary of the CHEERS report because "the results have no bearing on risk determination or evaluation." U.S. EPA Resp., at 5.	The stool sample analysis in the CHEERS report was not critical to the report's central conclusions, which were based on sufficient and validated data not involving stool sample results. The stool sample results do not contradict any of the conclusions of the CHEERS study and are consistent with the main finding that incidence of illness can not be linked to microbial water quality. Accordingly, the argument that the stool sample analysis was inconclusive is a minor point (and one that the District does not concede), because the CHEERS study's conclusions were supported by numerous data unrelated to stool sample results. As to the peer reviewer comment, Dr. Dorevitch testified that he disagrees with the comment, and gave detailed reasons. Oct. 19, 2011 Hearing, Testimony of Dorevitch, at 201-204. U.S. EPA says nothing to dispute Dr. Dorevitch's explanation of why his methodology and analysis was appropriate.
U.S. EPA argues that it "believes that more work would need to be done before conclusions can be confidently drawn as to why fishers and boaters have a higher rate of gastrointestinal illness." U.S. EPA Resp., at 5.	The District does not disagree with U.S. EPA's statement that more work should be conducted to research this issue. But merely because the underlying cause of the higher rate of gastrointestinal illness needs to be researched further does not undermine the undisputed facts and data that show that the higher rate does exist. Indeed, U.S. EPA does not dispute the fact that fishers and boaters have a higher rate of gastrointestinal illness.

Environmental Groups' Response Comments[4]	**The District's Reply**
Environmental Groups argue that Dr. Gorelick's testimony shows "that a 'similar result' in a replication study would be any result within the 95 percent confidence bounds – which would encompass a result in which there were as many as 10 additional illnesses among CAWS recreators versus GUW recreators." Environmental Groups Resp., at 2.	During the October 20, 2010 Board hearing, Dr. Gorelick was asked "Do you agree that would be very surprising if there was a different result in a different study [than the CHEERS report]?" Dr. Gorelick answered "The most likely result would be a similar result to what they found." Oct. 20, 2010 Hearing, Testimony of Gorelick, at 134. In addition, the Environmental Groups conveniently ignore that Dr. Gorelick also testified that while there could be 10 additional illnesses in the CAWS recreators versus GUW recreators, it is also equally as likely that there could be 10 fewer illnesses in the CAWS. *Id.* at 135("So he [Dr. Dorevitch] 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.")
Environmental Groups argue that the District misinterprets Dr. Dorevitch's findings regarding handwashing. Environmental Groups Resp., at 2-3.	The clearest statement on this issue is from Dr. Dorevitch himself: "The data were reanalyzed to account for differences in handwashing between the CAWS and GUW groups. In that analysis, the rate of illness for CAWS and GUW participants was no longer statistically significant (p=0.201). In other words, the higher rate of eye symptoms in the CAWS group was no longer apparent." District Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Item 2, at 4 (Jan. 3, 2011). Given these facts, the minor nature of the eye symptoms at issue, and the enormous costs of disinfection (at least $919.6 million), imposition of a disinfection requirement has not been justified as economically reasonable.
Environmental Groups argue that the "District's Response confirms the ineffectiveness of filtration as a substitute for disinfection. . . . While disinfection removes nearly all pathogen indicators from	The documents submitted on January 3, 2011 by the District did not show that the removal of bacterial indicators from filtration in a nutrient removal plant would be less than 50 percent. Instead, as stated in the District's Response Comments, the type of filtration necessary to achieve the most likely nutrient reduction scenarios would remove between 60 and 98 percent of fecal coliform from plant secondary effluents,

[4] The Environmental Groups' Response Comments are taken from the "Environmental Groups' Response to Comments Submitted By [the District] Concerning Proposed Effluent Bacteria Standards," filed on January 31, 2011.

the effluent . . ., the District's studies found less than 50 percent removal of fecal coliform using filtration . . ." Environmental Groups Resp., at 3.	depending on design parameters. *See* District Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Item 7F (Jan. 3, 2011). Specifically, the District provided several items of information on this issue. First, the District provided data from 2005 and 2006 indicating removal rates from filtration at the District's John E. Egan and Hanover Park WRPs of 55.1% and 31.7% of E. coli, respectively, without nutrient removal systems in place. *Id.* However, the Environmental Groups ignore the other items of information provided by the District on this same issue. In 2007 and 2008, the District conducted a full-scale study on phosphorus reduction at the Egan WRP. *Id.* This study involved chemical treatment that will likely be necessary under upcoming nutrient requirements, and found that the fecal coliform removal rate was 59.6%. *Id.* In addition, the District provided information from other plants around the country, which shows that bacteria removal rates for different types of nutrient removal technologies can be as high as 99.3%, 97%, and 71%. *Id.* Accordingly, the "average removal rate of indicator bacteria, [fecal coliform], in nutrient removal processes, particularly through filtration process, varied from approximately 60% to 98%, depending on design parameters . . ." *Id.*
Environmental Groups state that "[w]e note as a general matter that the [District's] response [to the U.S. EPA's critique of the Geosyntec Risk Assessment] addresses only a subset of the lengthy list of criticisms leveled at the study by USEPA." Environmental Groups Resp., at 4.	The Environmental Groups' argument is utterly wrong. The District twice responded to U.S. EPA's criticisms of the Risk Assessment. In each of those responses, the District responded to all of the issues raised by U.S. EPA. *See* District Response to U.S. EPA's Review of Geosyntec's Response to the U.S. EPA's Comments (Jan. 3, 2011); *see also* District Responses to U.S. EPA's Technical Review Comments Regarding the Risk Assessment (April 10, 2009).

Environmental Groups argue that "[c]oncerning USEPA's point that the GUW waters are an inappropriate comparison to the CAWS because both have elevated indicator levels, Dr. Dorevitch offers only a tentative suggestion – contravening long-held scientific understanding – that indicator levels may not signify fecal contamination . . ." Environmental Groups Resp., at 4.	The CHEERS study's comparison of the CAWS to the GUW was appropriate because the sources of effluent are similar except for one primary difference – the CAWS receives secondary treated undisinfected effluent - and the recreational activities of the CHEERS participants in CAWS and GUW are the same. The Environmental Groups imply that the CHEERS results are somehow wrong, but fail to recognize that U.S. EPA agrees with the District on this point, and has stated that "the fact that similar levels of illness were reported for both groups [CAWS and GUW] of recreational sites in the CHEERS study is not, in retrospect, unexpected." U.S. EPA Resp., at 4.
Environmental Groups argue that Dr. Dorevitch ignores "the many sources of bias toward the null identified in this proceeding that significantly increase the chance of this type of error." Environmental Groups Resp., at 4.	The District has already addressed at length any comments that allege there are factors that will result in bias in the CHEERS report. *See* District Responses to Comments on the Proposed Effluent Bacteria Standards, at 16-19 (Jan. 31, 2011).
Environmental Groups argue "that the District's estimates of annual rainfall days were substantially inflated due to an unsupported assumption of 3 days of lingering impacts; and an assumption of lingering impacts even if rainfall did not trigger a CSO event." Environmental Groups Resp., at 5.	The District's sampling and modeling studies have indicated that the lingering effect of each individual wet weather event varies depending on various factors like amount of precipitation, location of precipitation, and pollutant type, and can range from one to 18 days. *See* Prefiled Testimony of Geeta Rijal, at Attachment V, Table AI-1 (Aug. 4, 2008); *see also* Prefiled Testimony of Charles Melching, at 6; at 17 (Exhibit 1); and Attachment 1, at 23 (Aug. 4, 2008); District Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Item 1, at 5 (Jan. 3, 2011). Even so, regardless of whether a 24-hour or 72-hour benchmark is used to define a wet weather event, the Environmental Groups do not dispute that a wet weather event is significant because it directly affects the water quality in the CAWS, and only dispute how to define a wet weather event.
Environmental Groups argue that the "District continues to ignore the requirements of 40 CFR 131.10(g), which	The Environmental Groups are simply wrong on these points. 40 C.F.R. §§ 131.10(g) and 131.11(a) only apply when currently applicable designated uses or water quality criteria are modified. IEPA's proposed rule is neither. Instead, IEPA's proposed rule

dictate the relevant standard regarding when treatment costs may be considered in determining designated uses." Environmental Groups Resp., at 5. Moreover, Environmental Groups argue that the District "fails to take into account that water quality standards must protect the 'most sensitive use,' 40 CFR 131.11(a) . . ." Environmental Groups Resp., at 5.	is a new effluent standard that would require disinfection at the District facilities, and should be adopted only if it is affirmatively demonstrated to be necessary to prevent pollution that would render the CAWS "harmful or detrimental or injurious to public health, safety or welfare," and only after consideration of its economic reasonableness. *See* 415 ILCS 5/13(a); 415 ILCS 5/11(b); 415 ILCS 5/3.545; 415 ILCS 5/27(a).
Environmental Groups argue that the "District does not, in fact, demonstrate that there is 'flexibility' on the USEPA 8 per 1,000 risk benchmark." Environmental Groups Resp., at 6.	The Environmental Groups continue to ignore that U.S. EPA's 8 per 1,000 benchmark is for primary contact uses such as swimming, which are not at issue in IEPA's proposed rule, and that U.S. EPA has not established a benchmark for risk based on secondary contact uses. Moreover, the Environmental Groups provide no response for the District's detailed explanation of why EPA's various benchmarks (including the 19 per 1,000 benchmark for marine waters) are not, in fact, designations of acceptable levels of population risk.
Environmental Groups argue that the "District misstates the law regarding 'sensitive waters' under 35 Ill. Adm. Code 302.209." Environmental Groups Resp., at 6.	As an initial matter, the Environmental Groups use the wrong term "sensitive waters," as the regulation applies to "protected waters." 35 Ill. Adm. Code 302.209(a). Moreover, the CAWS would need to be classified as a general use water in order to qualify as a protected water. 35 Ill. Adm. Code 302.209(a); *see also* District Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Item 4 (Jan. 3, 2011). It is undisputed that the CAWS is not a general use water and IEPA is not proposing that the CAWS be considered such. In addition, the CAWS is not a protected water under 35 Ill. Adm. Code 302.209(a) for the reasons stated in Item 4 of the District's Responses to Information Requests at the October 19 and 20, 2010 Hearings.

II. The Proposed Rule Is Not Economically Reasonable

The Environmental Groups and U.S. EPA have asserted that the cost estimates provided by the District are unreasonable. Each of the issues raised is summarized and addressed below. Regardless of what cost estimates are used, however, it is undisputed that disinfection will impose significant financial burdens on the residents of Cook County. This is particularly true when considered in the context of the range of upcoming requirements that could be imposed as a result of this rulemaking and other regulatory initiatives. The Board must balance those significant costs against any benefits that have been demonstrated to result from imposition of disinfection requirements. Because those benefits would be only minimal, at best, the Board should conclude that the Proposed Rule is not economically reasonable.

U.S. EPA's Response Comments	**The District's Reply**
U.S. EPA argues that the District's nutrient removal technology costs are substantially higher than costs provided for in a U.S. EPA document entitled "Municipal Nutrient Removal Technologies Reference Document." U.S. EPA Resp., at 6.	As an initial matter, U.S. EPA seems to imply that the District ignored the document "Municipal Nutrient Removal Technologies Reference Document." (the "Nutrient Removal Document"). That is simply incorrect, because the District derived its cost estimates for nutrient removal from the Nutrient Removal Document. Chapter 3 of the U.S. EPA document reports nine case studies related to the removal of either total phosphorus ("TP") or total nitrogen ("TN"). The flows of these nine plants range from 3 to 110 MGD, and the unit capital costs range from $0.58 to $3.03 per gallon per day ($/gal/day), with an average of $2.25 /gal/day. *See* Nutrient Removal Document, Table 3-5, at 3-38 and 3-39. None of the plants remove both TP and TN to the levels the District used in its estimate. Accordingly, the District's costs for nutrient removal of both TP and TN should be higher than the costs in the Nutrient Removal Document's case studies. However, the District's cost estimate of $2.50 /gal/day is still within the range of the case studies in the Nutrient Removal Document, and, thus, the estimate is reasonable. The District will further address this point below in response to the Environmental Groups' comments.
Environmental Groups' Response Comments	**The District's Reply**
Environmental Groups argue that the "District presents no new data to contravene the USEPA-commissioned SAIC report conclusion that the District's cost estimates for disinfection are significantly inflated." Environmental Groups Resp., at 7.	The testimony from David Zenz from the October 27, 2008 hearing directly addresses the criticisms from the SAIC report, and no new data is necessary to address the flaws in that report.

Environmental Groups argue that the District fails to show that the costs of "$2.86 per household per month as opposed to $1.94 per household per month . . . would result in 'widespread economic and social impact' per UAA Factor 6 . . ." Environmental Groups Resp., at 7.	Again, the Environmental Groups mistakenly rely on the "widespread economic and social impact" factor that is only supported by the federal Clean Water Act regulation regarding the modification of designated uses. Instead, the proper standard for assessing the costs related to effluent standard proposed by IEPA is "technical feasibility and economic reasonableness." 415 ILCS 5/27(a) ("In promulgating regulations under this Act, the Board shall take into account…the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution."). Moreover, the Environmental Groups use the household numbers to gloss over the fact that the District has shown that disinfection will likely cost at least $919.6 million, with little or no benefit to the CAWS or to the public. In addition, the District will likely face substantial costs related to compliance with proposed or expected DO and nutrient removal requirements. *See* District Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Items 7B-7F; Prefiled Testimony of David Zenz – Dissolved Oxygen Enhancement Studies (Aug. 4, 2008). Tax rates could rise as much as 115-209%, and user fees could rise as much as 61-146%. District Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Items 6, 7D. Given all of these impacts, and the fact that disinfection will provide little or no benefit to the CAWS, the proposed effluent standards are economically unreasonable under the Illinois Environmental Protection Act.
Environmental Groups argue that the "District's estimate of 'present value' costs conflicts with basic financial principles that require that the time value of money be recognized." Environmental Groups Resp., at 7.	At the October 27, 2008 hearing, Dr. Zenz fully explained the basis for the present value costs over 20 years with a 3.0% interest rate and a 3.0% inflation rate. Oct. 27, 2008 Hearing, Testimony of Zenz, at 160-163. Specifically, Zenz testified that the "District typically gets three percent on short-term investments, and three percent is typical number that engineers use, so we felt that that number was correct. Inflation rate, we looked at – there's a variety of inflation indices which are out there, and actually for the period that we were looking at, they were actually a little bit less than three percent. . . . Just to close the loop on it, we looked at three common inflation indicators, gross domestic product equator, consumer price index and producer's price index. And for the last ten years, they've been 2.6 percent, 2.9 percent, and 2.6 percent. We use three percent because we thought this was a reasonable yet conservative number. So that's what we used. That's how we arrived on it. And

	again, repeating most – for most District calculations, we use an interest rate of three percent, and that's their typical actual rate that they usually receive on short-term investments, and that, of course, changes depending on the investment market. So that's how we reach a decision on those two numbers." *Id.* at 160-161. This explanation for the rates was based on real, historical financial numbers, and does not conflict with "basic financial principles" as argued by the Environmental Groups. In addition, the following explanation of the District's investment strategy illustrates why it was fitting for the interest rate to be based on a 3% nominal rate of return on investment when calculating present value. • According to Illinois Statute (30 ILCS 235, Public Funds Investment Act) and the District's Investment Policy as revised 4/12/2001, the District is limited to investing in fixed income investments of a duration of 3 years or less. Investments are limited to U.S. Treasuries, U.S. government agency securities, certificates of deposit, municipal bonds, high grade commercial paper, and overnight funds invested in U.S. government securities. Bond sale proceeds are utilized to fund the District's Capital Improvements Program. U.S. Treasury regulation 1.148-2(e)(2)(A) requires that 85% of bond issue proceeds must be spent out within 3 years of receipt. • The District utilizes a 3% nominal investment rate of return assumption for its general assets. The average interest rate earned for all District investment purchases for the six year period from 1/1/2005-12/31/2010 was 3.07%. This period provides a good cross section of interest rates with record interest rates on earnings in 2006-2007, and historically low interest rates in 2009-2010. The average is very close to the nominal rate of return assumption of 3%. • The fixed income market utilizes the U.S. Treasury Bond to benchmark investment returns. Included below are annual interest rates earned for the 2 year Treasury bond for the period 2000-2010 (approximately two market cycles). The 2 year Treasury average rate of 3.042% calculated below slightly exceeds the average duration of the District's portfolio which is 1.34 years, yet is very close to the investment rate of return assumption for general assets that is utilized by the District. Furthermore, Appendix C of OMB

	Circular A-94 dated December 10, 2010 defines the nominal interest rate to use for 3-Year investment maturities as 1.4% which is well below the rate utilized in the District's nominal investment rate of return assumption. The circular also defines the 3-year real interest rate as 0%. Therefore, utilizing a cost inflation rate that is equal to the interest rate in the present worth calculation is appropriate. 2 Year Treasury: Average = 3.042% 2000, 6.26 2001, 3.83 2002, 2.64 2003, 1.65 2004, 2.38 2005, 3.85 2006, 4.82 2007, 4.36 2008, 2.01 2009, 0.96 2010, 0.70 Source: www.federalreserve.gov (Selected Interest Rates-Historical Data) NOTE: The District investment policy was amended 7/8/2010 to allow for a maximum maturity of 5 years for District investments. This change was made in an attempt to garner additional yield in this historically low interest rate environment. Since only a small portion of the portfolio will be available to invest for the five year duration (the U.S. Treasury regulation still applies, providing a 3 year maximum investment period for all funds available for capital expenditure), it is not anticipated that the increase in permitted investment duration will materially increase the rate of return assumption for the District's portfolio.

Environmental Groups argue that the "District presents no meaningful cost estimate for DO compliance, and fails to separate out costs of remediating current non-compliance. It is impossible to understand how MWRDGC calculates the costs of meeting the proposed DO standard from the documents currently in the record." Environmental Groups Resp., at 8-9.	The Environmental Groups completely ignore the pre-filed testimony of David Zenz that was filed with the Board. *See* Pre-Filed Testimony of David R. Zenz – Dissolved Oxygen Enhancement Studies (Aug. 4, 2008). In his testimony, Zenz provided specific cost estimates, based on a Marquette University study that determined the specific control measures needed to attain 100% compliance with IEPA's proposed DO standards.
Environmental Groups argue that a dissolved oxygen ("DO") cost analysis "should also take into account that the CSO events might also be addressed with steps that cost the District less money than supplemental aeration. For example, passage and implementation of a strong stormwater ordinance could reduce the amount of water that enters the CAWS during precipitation events." Environmental Groups Resp., at 9.	This comment is complete speculation. The Environmental Groups had every opportunity to present evidence on this issue and failed to do so. There is no evidence in the record that shows what effect any stormwater ordinance would have on the CAWS during precipitation events, or whether any municipality would consider such an ordinance.
Environmental Groups argue that if "the District intends to try to prove that meeting the proposed DO standard would cause 'widespread social and economic impact,' it should explain why Cincinnati, Cleveland, Indianapolis, Kansas City, Evansville and other Midwest cities have agreed to take the necessary steps to control their combined sewer overflows." Environmental Groups Resp., at 9.	The Environmental Groups' comparison of the Chicago area to the Midwest cites listed in the Environmental Groups' comments is misleading. The District is implementing the unique and massive Tunnel and Reservoir Plan ("TARP"), which will divert storm water into temporary reservoirs and reduce the harmful effects of CSOs. Moreover, the other Midwest cities took steps to control their CSOs because of issues related to bacteria discharges, not for DO compliance. Furthermore, the District is not presenting DO costs to establish "widespread social and economic impact." Instead, the District is presenting the DO cost estimates to show the total economic burden that faces the District - and its taxpayers and payers of user fees - due to proposed and expected requirements. Given these facts, and the size of the Chicago area compared to the other Midwest cities listed by the Environmental Groups, it is not appropriate to compare Chicago to cities such as Evansville, Indiana.

Environmental Groups argue that "a number of low-tech approaches to the problem of stormwater should also be studied and implemented." Environmental Groups Resp., at 9.	The Environmental Groups' comment does not specify what low-tech approaches should be implemented and, thus, the Board should ignore the Environmental Groups' argument. The Environmental Groups have had years to present evidence on this issue, but have failed to do so.
Environmental Groups argue that "when the District presents an intelligible estimate of the cost of meeting the proposed DO standard, it should subtract the cost of meeting the existing DO standard, which it has failed to do in the guestimate it presented to the Board." Environmental Groups Resp., at 9.	The cost of meeting the existing DO standard should not be subtracted from the District's DO cost estimate. IEPA has proposed new DO standards for the Board's consideration, on the basis that the current DO standards are not appropriate. Should those new proposed standards go into effect, the District's compliance will require a new set of costs that are wholly unrelated to compliance with the current DO standards.
Environmental Groups argue that the "District's cost estimates for nitrogen and phosphorus control are seriously inflated." Environmental Groups Resp., at 9	The methods for developing the District's two cost estimates for nutrient removal have been stated clearly in Item 7B of the District's Responses to Information Requests at October 19 and 20, 2010 Hearings. The method for developing cost estimates for Scenario #2 (*see* District Responses to Information Requests at Oct. 19 and 20, 2010 Hearing, Item 7B, Attachment 2) is to use the unit costs developed by U.S. EPA using CAPDETWorks software, which was originally developed by the U.S. EPA and U.S. Army Corps of Engineers as a planning tool. This is a valid method for deriving planning level cost estimates. The unit capital cost selected is $2.50 /gal/day and the unit O&M cost is $500 per million gallons treated ($/MG treated). As stated in the U.S. EPA "Municipal Nutrient Removal Technologies Reference Document" (the "Nutrient Removal Document") published in 2008, the output from the CAPDETWorks software "is in contrast to the Maryland study, the Connecticut study, and the case studies, in which labor and maintenance material costs were excluded. This means that the CAPDETWorks O&M estimates will be higher than those for similar systems in those studies." U.S. EPA Nutrient Removal Document, at 4-7. Accordingly, the District justifiably included labor and maintenance costs in its estimate, which may explain why the Environmental Groups mistakenly consider the estimate "inflated."

Environmental Groups argue that the District's nutrient removal cost analysis is flawed because "the nutrient removal task that the District would undertake is not, on a per gallon basis, comparable to most of the plants considered in the EPA Municipal Nutrient Removal study or the Chesapeake Bay study. The District's facilities, which are larger, should have cheaper per-gallon removal costs than the smaller facilities considered in these studies." Environmental Groups Resp., at 11.	As an initial matter, the Environmental Groups' argument is pure speculation and does not offer any real evidence or data to verify their point. As a result, the Board should ignore this argument. In addition, the unit capital costs from the District's two scenarios range from $1.23 to $2.50 /gal/day, which are clearly within the range of $0.22 and $5.20 per gpd capacity reported in the U.S. EPA Nutrient Removal Document from literature review and case studies. *See* Nutrient Removal Document, §§ 4.1.1 and 4.1.2, at 4-1 to 4-4. The District's unit capital costs are also comparable to the unit capital cost of $2.01 /gal/day for the 100 MGD plant at Clark County, Nevada, which does not remove nitrogen to 3 mg/L (as the level used by the District in its estimate), as reported in Table 3-5 on page 3-39 of the Nutrient Removal Document.
Environmental Groups argue that "any comparisons with the historical experience of the relatively small plants covered in the USEPA and O'Brien & Gere studies should be considered in light of the fact that the District does not plan to begin construction of nutrient removal facilities until 2023 after completion of prototype works. It would be surprising, if not scandalous, if the District – given 12 years and huge economies of scale – cannot do better than small plants in Maryland and elsewhere that were racing to meet permit limits that had been imposed on them." Environmental Groups Resp., at 11.	Despite their colorful rhetoric, the Environmental Groups' argument is again based on conjecture. There is no evidence to show that the District can somehow "do better" than other sewage plants in terms of costs for nutrient removal. Therefore, the Board should ignore the Environmental Groups' comment on this point. As to the Environmental Groups' argument about economies of scale, the effect of economies of scale is reflected in the U.S. EPA's modeling study as reported in Chapter 4 of the Nutrient Removal Document. This effect decreases as flow volumes increase, as shown in Figures 4-21 and 4-22 of the Nutrient Removal Document. *See* Nutrient Removal Document, at 4-31. In other words, as larger and larger plants are considered, the economies of scale diminish. Regardless, the District used the information reported in the U.S. EPA document for deriving cost estimates for nutrient control for Scenario #2. The District estimates considered that the unit capital cost for the 100 MGD plant at Clark County, Nevada, which does not remove nitrogen to 3 mg/L, is $2.01 /gal/day. *See* Nutrient Removal Document, Table 3-5, at 3-39.
Environmental Groups argue that "the District's estimates do not take into account the fact that nutrient standards could be met through retrofits, rather than construction of	For implementing combined nitrogen and phosphorus removal to very low levels (3 ppm TN, 0.1 ppm TP), U.S. EPA's Nutrient Removal Document indicated that "[a]ll the technologies used a combination of biological nutrient removal to achieve nitrification/denitrification and some phosphorus removal, plus chemical phosphorus

expansion plants." Environmental Groups Resp., at 11.	removal to polish the effluent to 0.1 ppm TP. All scenarios included a tertiary filter (or denitrification filter), and all except the SBR included a tertiary clarifier to help get solids (and thus TN and TP) lower." Nutrient Removal Document, at 4-29. The District properly considered the following factors when choosing the plant-expansion option instead of the retrofitting option: • None of the existing District WRPs have tertiary clarifiers. • The three large District WRPs have no tertiary filters. • The three large District WRPs were not designed for nitrification 80 years ago. • Retrofitting requires that there is sufficient existing secondary aeration tank capacity that can be retrofitted for biological nutrient removal. However, the existing aeration capacity, which can be represented using hydraulic residence time ("HRT"), is significantly less than the suggested HRT of 15.5 hours for Process 4 in Table 4-11 of the Nutrient Removal Document. The greater the HRT is, the larger the amount of aeration tank capacity that is required for biological nutrient removal. The existing aeration tank capacity at the three large District WRPs at the corresponding design average flow ("DAF") is 5.6 hours at the Calumet WRP, 4.9 hours at the North Side WRP and 4.2 hours at the Stickney WRP, which is only about one third of the 15.5 hours suggested in the Nutrient Removal Document. Even if the HRT of 11.8 hours for Process 3 in Table 4-11 of the Nutrient Removal Document would be used, the three large District WRPs would still need to add at least enough new tanks to double their aeration capacity (as opposed to tripling their capacity, which would be needed for Process 4). However, Process 3 would require more chemical usage than Process 4. • Process 4 was selected for nutrient removal at the District WRPs. The main reason for selecting Process 4 is that it requires less chemicals for P removal. Large plants have disadvantages in chemical usage, because of mixing requirements for efficiently dispersing chemicals into the water. The chemical usage for P removal is chemical stoichiometry-based (the ratio of

	chemical to nutrients) and has no economies of scale. • There is limited space in the three large WRPs for such expansion of secondary aeration tank capacity for biological nutrient removal, and the existing hydraulic heads may not be sufficient for delivering the wastewater to the new tanks by gravity. This means that a new pumping station may be required. For example, at the North Side WRP, a new plant including pumping station, primary treatment and enhanced biological nutrient treatment, may have to be built on vacant land to the north of the railroad tracks and existing plant in order to meet the stringent nutrient standards, as the existing plant will not be sufficient for handling the design average flow after retrofitting for nutrient removal.
Environmental Groups make multiple arguments that the costs of nutrient removal may be reduced in coming years: "Of course, all of these numbers are highly speculative and depend on guesses as to what treatment levels will be required in 2023 and what technologies may be developed or improved in the meantime. Further, improved regulation of fertilizer, improved stormwater controls and wetlands restoration may reduce the costs of nitrogen and phosphorus treatment at the plant. Still further, the District's calculation makes no allowance for the fact that in 12 years or less it should be possible to harvest nutrients from sewage and sell them. . . . Treatment for phosphorus may also yield additional benefits in that enhanced biological nutrient removal also reduces the amount of pharmaceutical and health care products in the water and increases the efficiency of UV	Again, none of these points are supported by actual evidence, despite the fact that the Environmental Groups have had years to develop and submit information related to these points. There is no evidence about improved regulation of fertilizer, improved stormwater controls or wetland restoration reducing the costs to the District for nutrient removal. Further, there is no evidence that the District would be able to harvest nutrients or what costs that would entail. Finally, there is no evidence as to the amount of costs that would be reduced because of purported increases in the efficiency of UV disinfection. These are all points that lack any evidence before the Board, other than general articles about the topics. Because the arguments are speculative and lack evidence, the Board should ignore them.

disinfection." Environmental Groups Resp., at 12.	
Environmental Groups discuss the tax burdens of nutrient removal on real estate tax bills and conclude "[w]hile none of us want to pay more real estate taxes or fees, the District's guestimates of the future costs of nutrient removal are certainly no basis for allowing it, almost alone among major American POTWs, to discharge undisinfected sewage." Environmental Groups Resp., at 13.	While the Environmental Groups seek to blithely dismiss the impacts of significant increases in taxes and fees, the bottom line is that there will be substantial costs to the District to comply, which must be passed on to taxpayers and payers of user fees. *See* District Responses to Information Requests at Oct. 19 and 20, 2010 Hearings, Items 7B, 7C, 7D, and 7E (Jan. 3, 2011). In addition to these costs, the District would also have to address the costs of imposing disinfection should the Board accept IEPA's Proposed Rule, with no or little environmental benefit to the CAWS, in addition to the costs of compliance with DO standards. Such a result would be economically unreasonable and in violation of the Illinois Environmental Protection Act. 415 ILCS 5/27(a).
Environmental Groups finally argue that "the District has simply not presented a credible alternative proposal for making the CAWS safer for recreation. The District's proposed 'alternative approach' is a regulation stating that it must continue to comply with its permit requirements." Environmental Groups Resp., at 13.	As demonstrated in the District's final comments, IEPA's proposed effluent standard that would require disinfection is economically unreasonable and not justified under the Illinois Environmental Protection Act. In addition, as shown by the CHEERS Supplement, there is no basis to impose a numeric water quality standard. Accordingly, the District has developed a proposal, based on specific narrative requirements, that ensures continued operation of the District's advanced treatment facilities and compliance by wet-weather sources with applicable permit requirements. This proposal protects recreational uses in the CAWS and fully complies with the Act.

III. The District's Proposed Water Quality Standard Is Supported By The Record

The District has proposed a water quality standard that ensures protection of the recreational uses of the CAWS, including compliance with all current and future permit requirements, combined sewer overflow long term control plans, and best management practices. This proposal is supported by the evidence presented to the Board, including the CHEERS Supplement finding that recreational health risks on the CAWS are not related to bacteria levels. The Environmental Groups criticize the District's proposed water quality standard as doing nothing beyond the "status quo." The Environmental Groups, however, have failed to demonstrate that anything beyond the current high quality level of effluent after secondary treatment is necessary to protect public health. The District's proposal will ensure that the current water quality is maintained, and that recreational uses of the CAWS are protected.

CONCLUSION

Other parties to this rulemaking have criticized the evidence presented by the District – including information specifically requested by the Board or IEPA. As explained in these responses, nothing in those criticisms diminishes the relevance and value of the information that the District has provided. More fundamentally, nothing in the record before the Board is adequate to demonstrate that the Proposed Rule is necessary or economically reasonable. Because the statutory requirements for adoption of an effluent standard have not been met, the Board should not adopt the Proposed Rule. Instead, the Board should consider adopting the District's alternative proposal, which protects recreational uses and is fully consistent with Federal and State law.

Dated: February 15, 2011

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

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