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 C
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 18th day of July, 2011, I, on behalf of the Metropolitan Water Reclamation District of Greater Chicago (the "District"), electronically filed with the Office of the Clerk of the Illinois Pollution Control Board, **the District's Testimony Questions for Roy Smogor.**

Dated: July 18, 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 Testimony Questions for Roy Smogor**, to be served via First Class Mail, postage prepaid, from One North Wacker Drive, Chicago, Illinois, on the 18th day of July, 2011, upon the attorneys of record on the attached Service List.

/s/ David T. Ballard
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METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO'S TESTIMONY QUESTIONS FOR ROY SMOGOR

1. On page 3, you state that the habitat reports contained no analysis to show how each variable in the habitat index and the fish metric related to a "relative degree of naturalness."

1a) Do all biotic and habitat indices have to show how each variable in the index is related to a gradient of human impact?

1b) If so, would it be your opinion that any biotic or habitat index that did not show how each of its variables is related to a gradient of human impact would be useless in determining biological potential?

1c) In the development of the QHEI, was it shown that each variable in the index was related to a gradient of human impact?

1d) In the development of the Ohio IBI, was it shown that each variable in the index was related to a gradient of human impact?

1e) Given the CAWS is entirely manmade or altered, effluent dominated, and flow controlled by the District, what degree of naturalness would you expect?

1f) Aren't all the waterways subject to these same anthropogenic effects?

1g) Wasn't this, in fact, the reason that LimnoTech felt it was necessary to create a CAWS-specific habitat index, since the QHEI would not show enough of a gradient in such a system?

2. On page 4, you state that the habitat reports did not "analyze relations between water quality and physical habitat throughout the CAWS."

2a) Do you mean that the study should have examined the cause-and-effect relationship between habitat variables and water quality variables?

2b) If so, how would you recommend one do this?

2c) Would it be necessary to do so for every combination of habitat and water quality variable?

2d) Can you give an example of a water quality variable in the CAWS, which would be relevant to fish condition and which you might expect to "co-vary" with a habitat variable?

2e) How would you test whether the water quality variable does actually "co-vary" with that habitat variable?

2f) In developing a habitat index, is it always necessary to determine whether each habitat variable "co-varies" with each water quality parameter?

2g) Did the developers of the QHEI determine whether each habitat variable "co-varies" with each water quality parameter that might possibly affect fish?

2h) Can you give an example of a habitat index where the developers determined whether each habitat variable "co-varies" with each water quality parameter that might possibly affect fish?

2i) You cite the example of riprap as a habitat variable that might actually be mistaken for a pollutant that is affecting fish. How would you investigate this possibility?

2j) Do you recall that during Mr. Bell's testimony on this issue he described how LimnoTech performed a Classification and Regression Tree or CART analysis?

2k) Do you agree that this technique is a valid method for evaluating environmental data to identify limiting factors to biota?

2l) Do you disagree with the finding that, when this method was applied to 40 habitat variables and six metrics of dissolved oxygen and temperature, that the analysis showed habitat variables are more limiting to fish in the CAWS that dissolved oxygen and temperature? If so, why do you disagree?

2m) Do you recall from Mr. Bell's testimony that he said LimnoTech had, subsequent to receiving pre-filed questions on his testimony, repeated the CART analysis using ammonia, specific conductivity, and chloride, as well as dissolved oxygen and temperature, and that the findings did not change?

2n) Are any of these water quality parameters that you would expect to "co-vary" with a habitat variable?

2o) If not, which water quality parameters measured in the CAWS would you expect to "co-vary" with a habitat variable?

2p) Did IEPA analyze relationships between water quality and physical habitat in their UAA analysis?

2q) Did IEPA determine whether the difference in QHEI scores might be due to different WQ parameters?

3. On pages 4 and 5, you raise concerns regarding direct cause-and-effect relationships between specific habitat variables and fish. Can you give an example of a habitat index that was developed by identifying direct cause-effect relationships between specific habitat variables and fish, rather than using statistical analysis on a group of data?

4. You state on pages 4 and 5 that the habitat evaluation interpreted that the statistical correlation between the combined fish metric and the CAWS habitat index was attributable entirely to differences in physical habitat," but that "the evaluation did not account for how correlation between water quality or other non-habitat factors and the selected physical-habitat measures could confound such an interpretation."

4a) Did the developers of the QHEI "account for how correlation between water quality or other non-habitat factors and the selected physical-habitat measures could confound" interpretation of the relationship of habitat and fish?

4b) If so, in what way did they do that?

4c) Can you identify any other habitat index that accounted for "how correlation between water quality or other non-habitat factors and the selected physical-habitat measures could confound" interpretation of the relationship of habitat and fish?

4d) If so, in what way did they do that?

4e) What "other non-habitat factors" could be affecting fish?

4f) You say "water quality or other non-habitat factors" in the above quote from your testimony; do you have any evidence that "other non-habitat factors" are affecting fish in the CAWS?

4g) What "other non-habitat factors" might you suspect of affecting fish in the CAWS?

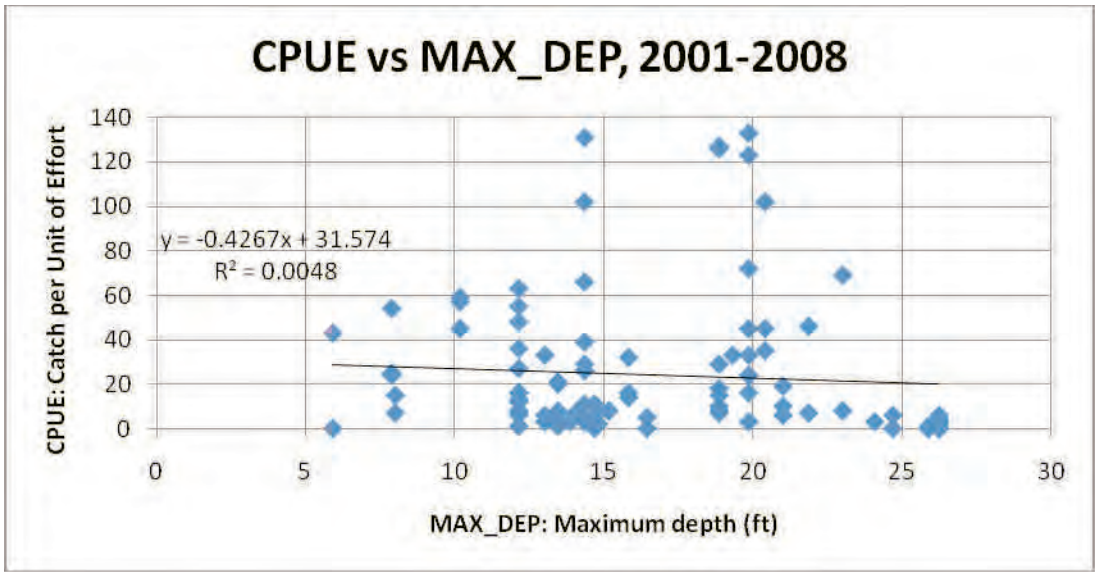
4h) If "other non-habitat factors" that are not water quality are affecting fish, isn't this further evidence that simply improving one or two water quality parameters might not help improve fisheries?

5. On pages 6 and 7, you stated that fish samples collected in deeper reaches may have lower scores simply because deeper sampling is not as accurate.

5a) Have you reviewed the literature references given by Mr. Bell in his testimony that state the effective depth to be approximately 4 meters? Do you disagree with these reports? Are you aware that one of these reports was authored by Christopher Yoder,

who helped develop the QHEI and who provided scientific reports that were used by Illinois EPA in this rulemaking?

5b) Would you say if more fish were caught in shallower waters of the CAWS that there should be a correlation between catch per unit effort and depth? Are you aware that (as shown by the chart below) LimnoTech performed that analysis and found there to be no correlation?



6. On page 6, you stated that it's possible that the habitat variables used by Limno Tech actually represent aspects of water quality.

6a) Which water quality variables do you guess are related to physical habitat variables?

6b) Are you familiar with the CART analysis that LimnoTech performed on water quality and physical habitat data? What were the conclusions?

7. On page 7, you state that the extent of overhanging vegetation may not be related to the quality of the fish community.

7a) Do you doubt that overhanging vegetation is good for fish?

7b) What water quality parameters are you concerned might be related to overhanging vegetation?

8. On page 9, you raise questions about the designation of Bubbly Creek in the MWRD proposal.

8a) Did the UAA report or IEPA contractor Ed Rankin assess physical habitat at all in the South Branch Chicago River or Bubbly Creek?

8b) Does IEPA feel that no assessment at all is superior to the assessment made by the District and LimnoTech?

8c) How did IEPA's designation for Bubbly Creek address that "the South Fork is a stagnant waterbody that receives no flow unless the Racine Avenue Pump Station, storm sewers or other CSOs are discharging." (page 1-8 of CAWS UAA report)?

8d) How did IEPA's proposal account for sediment toxicity and contamination in Bubbly Creek?

8e) Does IEPA still contend after all the District testimony throughout these hearings, that conditions in Bubbly Creek are similar enough to the North Branch Chicago River that it doesn't warrant its own habitat assessment?

9. On page 9, you make several arguments based on the scores in the Habitat Improvement Report, which reflect possible habitat improvements.

9a) Did the District state that the theoretical scores after extensive improvements were used to classify ALU categories?

9b) Wasn't it actually the current CAWS habitat index scores that provided the basis for the classifications?

9c) Are you aware that the potential habitat scores you are citing assume, for example, that half the vertical walls in the North Branch Chicago River could be removed?

9d) To your knowledge, is anyone planning on removing any of the vertical walls in the NBCR let alone ½ the length in the near future?

9e) Would this even be consistent with the current functions of drainage and navigation (in the lower North Branch Chicago River)?

10. On page 10, you criticize the use of other variables in the CAWS habitat index that were not identified using the multiple linear regression process, including overhanging vegetation, bank pocket areas, large substrate, and organic sludge.

10a) Do you believe that pockets of bank refuge, as quantified by the variable "bank pocket areas", are important to fish?

10b) If so, do you agree they should be included in an index of habitat quality? If not, why not?

10c) Do you believe that large substrate is important to fish?

10d) If so, do you agree they should be included in an index of habitat quality? If not, why not?

10e) Would you criticize an aquatic habitat index that did not include some measure of substrate condition?

10f) If a measure of large substrate is inappropriate, what would you suggest using?

10g) Do you believe that the presence of organic sludge on the bed of the CAWS, which was used in the District's habitat study to represent "a general substrate condition in some of the CAWS reaches that indicates very fine sediment with residual impacts of industrial chemicals", is an important habitat quality for fish?

10h) If not, do you believe that some measure of sediment chemical quality in the CAWS should be considered in assessing aquatic habitat condition in the CAWS?

10i) How is the QHEI superior to the CAWS habitat index in the way it assesses sediment chemical quality?

11. On page 10, you discuss existence of commercial navigation and sediment toxicity in the Lower North Branch Chicago River and the Little Calumet River.

11a) Did Ms. Wasik's testimony indicate that the habitat index scores were only one of the factors used to classify the waterways?

11b) Did she state that other factors were used if the Habitat Index Scores were borderline? According to her testimony, was the Little Calumet River score (52) borderline? Was the Lower North Branch Chicago River (47)?

12. On page 11, you claim that Bubbly Creek was not properly classified given its habitat score. Is it your feeling that physical habitat alone should be used to classify Bubbly Creek, despite all of the other information about Bubbly Creek that has been provided by IEPA contractors and the District?

13. On page 12, you express a concern that the habitat reports did not address how the fish metric scores relate to Clean Water Act goals. Did IEPA relate the range of Ohio IBI scores to ALU potential in the CAWS? If so, how?

14. On page 12, you state that "the CAWS habitat evaluation lacks an analysis that shows that higher scores of the CAWS combined fish metric represent a less-impacted biological condition than do lower scores and vice versa."

14a) If the CAWS combined fish metric is the sum of positive metrics that represent desirable fisheries attributes and negative metrics that represent undesirable fisheries attributes, wouldn't a higher value of that sum represent a more desirable fisheries condition than a lower value?

14b) Do you agree that the following fish metrics that are included in the CAWS combined fish metric are positive indicators of fisheries condition: Illinois ratio of non tolerant coarse-substrate spawners, number of Illinois native minnow species, number of Illinois native sunfish species, and the Illinois ratio of generalist feeders?

14c) In fact, aren't these four metrics also included in the Illinois fish IBI that you have been working on for several years?

15. On pages 13 and 14, you express concerns regarding the selection of fish metrics. As to each metric used in the habitat reports, please explain whether it is used in other fish metrics and IBIs, and explain the extent to which it is a good indicator of fish community health.

16. On page 13, you state that the fish metrics should have been tested for how they respond to gradients of human impact.

16a) Is it necessary to show this for each water body in which the metric is used?

16b) Are individual metrics evaluated in this way in the development of each IBI?

16c) Please describe how the authors of the Ohio IBI showed that each fish metric they selected responds in a sensible way to a gradient of human impact.

16d) Which fish metrics used in the CAWS combined fish metric do you believe do not vary with a gradient of human impact?

16e) How would you evaluate fish metrics response to a gradient of human impact in a system like the CAWS, which has approximately equal human impact throughout?

16f) What would you use for a reference reach in the CAWS?

17. On page 14, you raise a concern that the fish metrics were not examined "over a large-enough range of human influence."

17a) What do you mean by "large-enough?"

17b) How does the, "large-enough range of human influence" criticism apply to a system designed, constructed and highly modified specifically for effluent conveyance and navigation?

17c) What waters of "lower biological potential" were used in the development of the Illinois IBI at the statewide or regional level that reflect the "range of human influence" found within and across the CAWS?

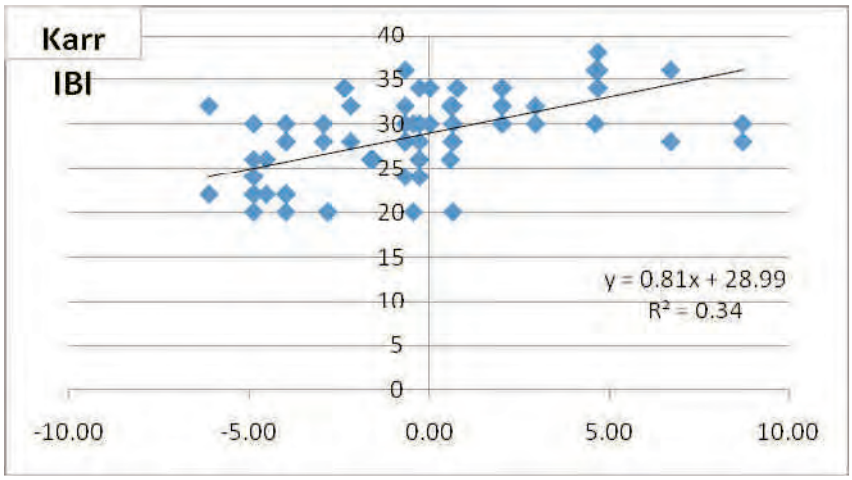
17d) What Illinois IBI metrics reflect the "lower biological potential" of a community that is connected to and influenced by fishes found in both Lake Michigan and a large modified river systems?

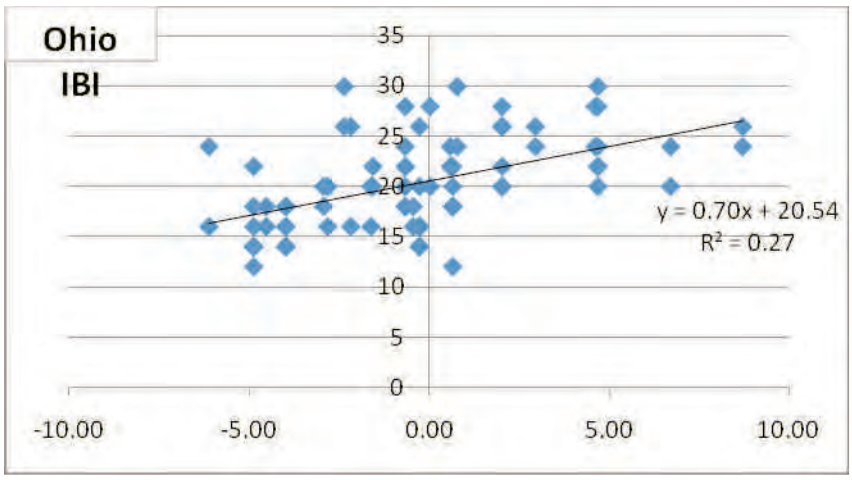
17e) To what extent was CAWS fish data used in the development of the Illinois IBI, given the highly unique characteristics of the system?

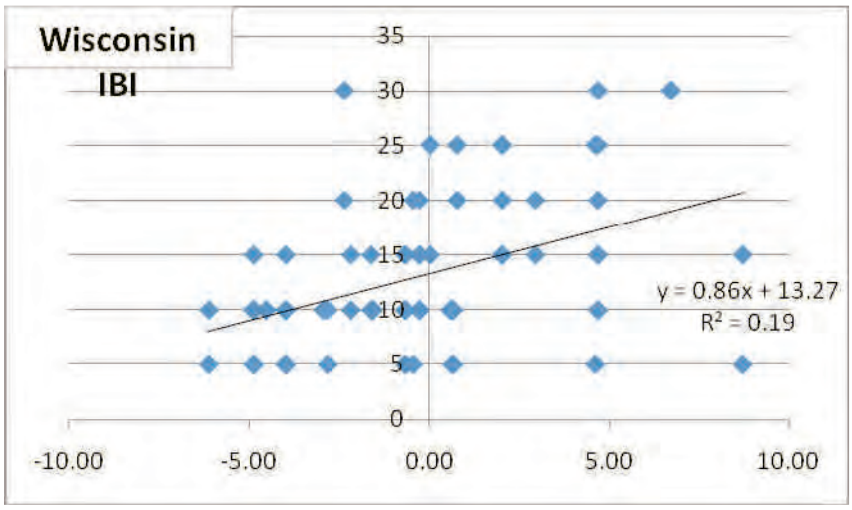
18. On page 15, you raise a concern that the habitat reports did not adequately assess other IBIs.

18a) Are you aware that Limno Tech has looked at the relationship of our habitat index to some of those other IBIs?

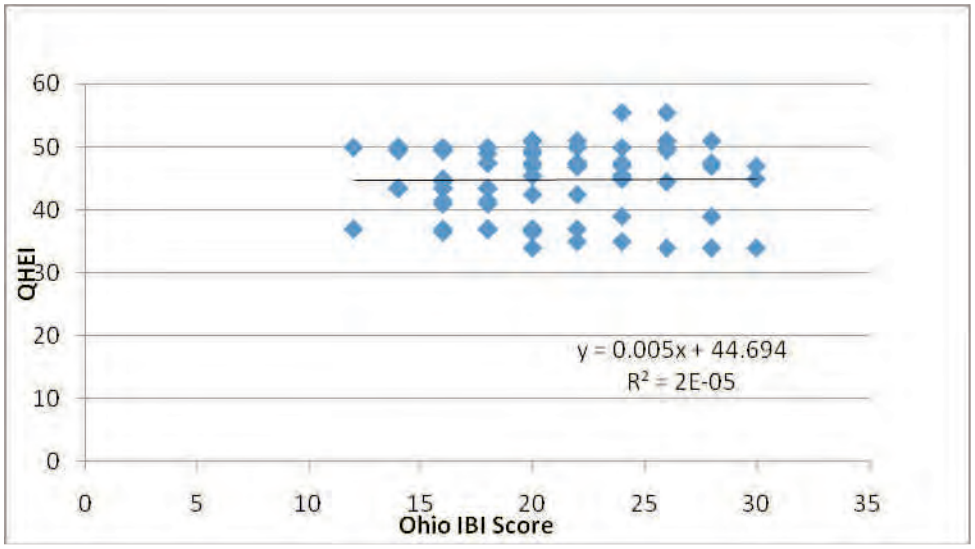
18b) Based on the charts below, do those comparisons show that those other IBIs show weaker correlations than does the CAWS habitat index?







18c) Based on the chart below, which scores CAWS stations using QHEI and the corresponding fish using the Ohio IBI (done by the District), do you agree that those Ohio systems are poor tools for use in the CAWS?



18d) In the IL IBI that you helped develop, did you use aspects of several existing IBIs?

18e) Aren't many of the metrics used in the Illinois IBI the same metrics used in many if not most other fish-based IBI's?

19. On page 15, you state that state-specific specifications must be applied to each IBI metric.

19a) Weren't the fish characterization assignments (such as pollution tolerance ratings) for the Illinois IBI derived from a number of sources including those from outside of Illinois (Fishes of Wisconsin, Fishes of Virginia, Ohio EPA)?

19b) How does IEPA treat species and assign characteristics to populations and communities that interact with Lake Michigan?

20. On page 17, you raise a concern about scoring adjustments for samples of certain sizes.

20a) Isn't it true that IEPA (or their contractor) themselves failed to use the adjusted value for number of individuals collected when they calculated the Ohio IBI, thus rendering the scores they supposedly used in their assessment inaccurate?

20b) Isn't it also true that IEPA never calculated or provided to the IPCB the corrected IBI values?

21. On page 18, you express a concern that only two water quality variables, DO and temperature, were examined for statistical relations with fish.

21a) Are you aware of the screening process that the UAA contractor used to assess overall WQ in the CAWS?

21b) Would it surprise you to learn that according to the UAA Report, DO and temperature were the only constituents that in most waterways were found not to meet General Use criteria >10% of the time?

21c) General Use WQ criteria are generally for waters which meet the CWA goal, correct?

21d) So is it safe to say that other constituents besides DO and temperature in the CAWS are not likely to impact fish communities since they are generally meeting General Use WQ standards?

21e) How did IEPA evaluate how physical habitat metrics measured in the QHEI corresponded with various WQ constituents in the CAWS? Why was it not important for them to do so?

22. On page 19, you state that no analysis was done as to how fish varied with "other water quality variables, such as specific conductivity, pH, and ammonia."

22a) Did the screening process used by your UAA contractor indicate that conductivity and pH were meeting general use WQ standards in the CAWS?

22b) To your recollection, did Scott Bell describe why Limno Tech focused on DO and temperature in his testimony in March and May, 2011?

22c) Are DO and temperature measured hourly through District's continuous monitoring program? Do they measure pH hourly?

23. On page 20, you make statements regarding how lower DO might correlate with better fish communities, "even if a strong linear relation is not readily apparent."

23a) Do you disagree with the UAA, which states (page 5-3): "*Improvements to water quality through various technologies, like re-aeration may not improve the fish communities due to lack of suitable habitat to support the fish populations. Unless habitat improvements are made in areas like the CSSC, additional aeration may not result in the attainment of higher aquatic life use.*"?

23b) Please clarify how the IEPA proposed dissolved oxygen criteria will lead to attainment of the IEPA proposed aquatic life uses in light of that statement.

24. On page 21, you explain why you believe that the Ohio IBI and QHEI are the proper tools to use to evaluate the CAWS waterways.

24a) Is it true that the QHEI scores for the CAWS were measured one time (March 2004) by a consultant, not including certain segments like Bubbly Creek and South Branch Chicago River? Was that the entire basis for your proposal?

24b) How often do you personally sample in the CAWS?

24c) Was the QHEI developed for wadeable streams, to your knowledge?

24d) Were modifications made to the QHEI to include an impoundments adjustment? Were those adjustments reflected in the scores you reported?

24e) During IEPA testimony, Mr. Sulski stated that Sheridan Road on the North Shore Channel was used as a reference site for the CAWS, but Mr. Essig's testimony later stated that the QHEI scores for Sheridan Road were transposed with the QHEI scores from Route 83 on the Cal Sag Channel. The District asked for corrected scores or field data with which to calculate the scores, which we never received. Can you explain how these mistakes impact the comparisons that were made for ALU classification?

24f) Did you state, in prior testimony, that "QHEI alone was not being used to make the final decision about attainable biological conditions. There was no single QHEI cut-off that defined that in and of itself."? If so, what other factors were used to make those decisions?

24g) In prior testimony, did you state that "if something is scoring a QHEI between, say, Level 1 and Level 2, and you want to decide do I put that into the Level 1 or do I put it into Level 2, you look at other things." What are those "other things?"

25. On pages 21 and 22, you state that the Ohio metrics should be used as a model to classify CAWS waters.

25a) Are you familiar with the Cuyahoga River Ship Canal in Ohio?

25b) Please explain how the IEPA has or has not considered a comparison between the Cuyahoga River Ship Canal and the CAWS, in light of the fact that Ohio was used as a model for CAWS classification.

25c) Please explain how using the Ohio system of ALU classification for the CAWS failed to place the CAWS in a category similar to that used by Ohio for the Cuyahoga River Ship Canal.

25d) Was the direct application of the Ohio QHEI and its findings to the CAWS ever linked to any actual biological data collected in the CAWS to confirm that a relationship exists?

25e) Do you recall testimony from LimnoTech, as well as statements in the Habitat Evaluation Report, stating that the QHEI did not relate well to biological conditions in the CAWS? Do you have evidence or analyses to contradict those findings?

25f) Aren't the QHEI metrics of pool quality, channel quality and substrate quality the strongest correlated metrics with the Ohio Fish IBI? Aren't these metrics, which may be of greater importance in Ohio, the least variable within and across the CAWS? In that case, doesn't that indicate that the QHEI and Ohio Fish IBI of less relevance in predicting fish quality in the CAWS than in Ohio waters?

Dated: July 18, 2011

Respectfully submitted,

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

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