ILLINOIS POLLUTION CONTROL BOARD
June 14, 2011

IN THE MATTER OF:	)	
	)	R 11-18
TRIENNIAL REVIEW OF WATER QUALITY STANDARDS FOR BORON, FLUORIDE AND MANGANESE: AMENDMENTS TO 35 ILL. ADM. CODE 302.SUBPARTS B, C, E, F AND 303.312	)	(Rulemaking - Water)

HEARING OFFICER ORDER

The first hearing in this matter is scheduled for June 21, 2011 in Springfield. Attached to this order are questions Board staff will pose to the proponent's witness.

In response to the hearing officer order of May 3, 2011 concerning the prefiling of testimony and questions in advance of that hearing, testimony was prefiled by the rule proponent, the Illinois Environmental Protection Agency (IEPA or Agency) (Testimony of Brian Koch, Toxicologist in the Water Quality Standard section of IEPA Division of Water Pollution Control filed May 23, 2011). Testimony was also prefiled by Marathon Petroleum Co. (Testimony of James L. Machin, P.E. filed May 23, 2011; tables revised May 26, 2011).

On June 13, 2011, the City of Springfield, Office of Public Utilities (Springfield) prefiled questions to be asked of the Agency's witness. As of the writing of this order, no other prefiled questions have been received. As Springfield prefiled the first set of questions, Springfield will be the first participant to question the Agency witness.

Board staff has also examined these participants' filings, and has developed questions for the Agency witness. To facilitate hearing efficiency and participants' ability to provide information, these questions are attached to this hearing officer order, beginning at p. 2. As the hearing date is fast approaching, the hearing officer will e-mail this order to IEPA today, in addition to having the Clerk's Office make usual mail service.

IT IS SO ORDERED.

Kathleen M. Crowley

Kathleen M. Crowley
Hearing Officer, Illinois Pollution Control Board
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Chicago, Illinois 60601
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R11-18
ATTACHMENT
To Hearing Officer Order of June14, 2011
Board Staff Questions for IEPA

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1. **STORET Numbers**

The Agency states that "STORET is defined in 35 Ill. Adm. Code 301.405 as "the national water quality data system of the federal Environmental Protection Agency [USEPA]" The Agency proposes to delete the STORET codes because they are no longer maintained and updated by USEPA. 12/2/2010 Statement. of Reasons (SR)at 10-11.

On USEPA's webpage for the "STORET Legacy Data Center" (http://www.epa.gov/storet/legacy/purpose.htm), USEPA notes, as does the Agency, that "EPA no longer updates this information, but it may be useful as a reference or resource." However, USEPA also states,

> As part of the STORET modernization project…[s]ome of the data [from the legacy STORET system] will then be migrated to New STORET." The bottom of the web page contains a link to both the new "STORET Data Warehouse" and the old "Legacy STORET Data Center". http://www.epa.gov/STORET/dbtop.html

USEPA describes the old "STORET Legacy Data Center" as "data supplied to EPA before 1999".

The new "STORET Data Warehouse is described as "data supplied to EPA since January 1, 1999". USEPA states

> The STORET Data Warehouse is currently receiving new data on a regular basis,…" The link to the introduction page for the new system is: http://www.epa.gov/STORET/about.html

USEPA's current brochure on the STORET system states:

> The original STORET was developed in the 1960s, and today the system continues to serve as EPA's principal repository for marine, freshwater, and biological monitoring data." (*See* http://www.epa.gov/STORET/archive/storet_brochure.pdf)

It appears that USEPA is continuing the use of a modernized STORET system.

Please comment on the appropriateness of continuing to use STORET numbers within the new STORET system, and the compatibility with the existing STORET numbers in the existing and proposed rules at 35 Ill. Adm. Code 302.

2. **35 Ill. Adm. Code 302.208 Numeric Standards for Chemical Constituents**

(a) What is a typical hardness value for Illinois streams?

(b) Based on this typical hardness value, please calculate the proposed Acute and Chronic Water Quality Standards (WQS) for fluoride, manganese, and zinc in 302.208(e).

(c) What is the highest hardness value for the proposed fluoride chronic standard in 35 Ill. Adm. Code 302.208(e) yielding a result that does not exceed 4.0 milligrams per liter (mg/L)?

(d) The Agency indicates "critical hardness concentrations in Illinois waters are rarely less than 90 milligrams per liter and no ambient water quality monitoring network stations are known to possess a critical hardness of less than 45 milligrams per liter." SR at 28. Generally speaking, what number or percentage of the monitoring network stations would exhibit a hardness value yielding a result under Section 302.208(e) that does not exceed 4.0 mg/L fluoride?

(e) By correcting the derivation of the zinc water quality standard in Section 302.208(e), does the Agency expect zinc standards to yield higher values?

(f) Proposed Sections 302.208(e) and 302.504(a) list the Acute and Chronic Standards for cyanide as being the same for either the weak acid dissociable (WAD) or the available form. Analytically speaking, is there a difference in the results for the "WAD" and "available" forms for an identical sample? If so, should there be different compliance standards depending on the method used?

3. **35 Ill. Adm. Code 302.304 Public and Food Processing Water Supply Standards**

In the Statement of Reasons, the Agency states

> because manganese often occurs in Illinois at concentrations above the existing water quality standards, the Public and Food Processing Water Supply [PWS] standard is exceeded in many surface waters with public water supply intakes and the Illinois EPA has been forced to list these waters on the Clean Water Act Section 303(d) list". SR at 5.

(a) Would it be possible for the Agency to provide a list of water segments with PWS intakes that exceed the current manganese water quality standard?

(b) Please comment on whether the Agency believes that all of the affected waterways would no longer be listed as impaired for manganese with the adoption of the proposed manganese standard.

(c) As to public water supplies drawing water from waters impaired for manganese, is the Agency aware of whether these PWS treat their intake waters to meet the drinking water maximum contaminant level (MCL) for manganese? If so, please comment on whether the proposed manganese changes would in any way affect the treatment operations of the affected public water supplies.

4. **35 Ill. Adm. Code 302.504(c) Water Quality Standards for the Open Waters of Lake Michigan**

In the Statement of Reasons, the Agency states:

> relocating the existing Lake Michigan Basin Standards of 1.0 mg/L boron and 1.4 mg/L fluoride into the Open Waters of Lake Michigan standards will provide a measure of protection against harmful loadings of these substances within these waters, and will continue to allow protection of these waters for Public and Food Processing Water Supply uses. SR. at 5.

(a) Is the Agency aware of whether there is a need for any formal interstate or federal cooperation on setting standards for the Open Waters of Lake Michigan?

(b) Is the Agency aware of whether boron and/or fluoride are currently being discharged into the Open Waters of Lake Michigan? If so, please comment on the identity or characteristics of such sources of boron and/or fluoride discharges.

(c) The Agency states that the Open Waters of Lake Michigan Standards are based on the background conditions rather than protection of human health or aquatic life. SR at 5. Is the Agency aware of the background levels of boron and fluoride in the Open Waters of Lake Michigan? If so, please comment on how the proposed standards for boron and fluoride relate to these background levels.

5. **35 Ill. Adm. Code 302.595 Listing of Bioaccumulative Chemicals of Concern, Derived Criteria and Values**
35 Ill. Adm. Code 302.669 Listing of Derived Criteria

In Sections 302.595 and 302.669, the Agency proposes to change the requirement from publishing the list in the *Illinois Register* to "the Agency's website."

(a) What does the Agency believe is the proposed benefit to the Agency and to the public of the proposed rule change?

(b) If the change is adopted, does the Agency plan to include some direction to the public on how to find this list on the Agency's website? Could the Agency's general internet address be included in the proposed rule?

(c) Has the Agency determined what term or phrase persons must use to search the Agency's website for the list (*e.g.* "Listing of Bioaccumulative Chemicals of Concern"? "Listing of Derived Criteria"?)?

(d) If the rule is adopted as proposed, does the Agency intend to give some sort of public notice when the Agency's website is updated? Does, or would, the website contain an archive showing the list as it existed in previous quarters?

Instead of replacing publication in the *Illinois Register* with publication on the Agency's website, would it be acceptable to the Agency to publish in both locations, thereby continuing the requirement for publication in the *Illinois Register s*o that public notice is given and a public archive is maintained?

6. **Site Specific Relief No Longer Needed**
Has the Agency already, or can it easily, identify any current adjusted standards, variances, or site specific rules that would become moot as a result of the proposed amendments? If so, what if any measures does the Agency typically take to notify such affected parties of the affect of rule changes on Board orders covering them? Is the Agency planning to take any measures to inform such sources affected in R11-18?

7. **Testimony Filed by Marathon Petroleum Company, LP re Compliance Schedule**
James L. Machin submitted prefiled testimony on behalf of Marathon supporting amendments and urging the Board to proceed as expeditiously as possible. Mr. Machin indicates Marathon's National Pollutant Discharge Elimination System (NPDES) permit provides a 15-month compliance schedule. Would the Agency please comment on whether the time provided in Marathon's NPDES permit for compliance can be extended by the Agency if this rule is not adopted before Marathon's compliance requirement goes into effect?

CERTIFICATE OF SERVICE

It is hereby certified that true copies of the foregoing order were mailed, first class, on June 14, 2011, to each of the persons on the attached list requesting service by mail. A copy was also e-mailed to the IEPA, and to participants who agreed to e-mail service.

It is also hereby certified that a true copy of the foregoing order was hand delivered on June 14, 2011 to:

John T. Therriault
Illinois Pollution Control Board
James R. Thompson Center
100 W. Randolph St, Ste. 11-500
Chicago, IL 60601

Kathleen M. Crowley
Hearing Officer
Illinois Pollution Control Board
100W. Randolph St. Ste. 11-500
Chicago, IL 60601

BEFORE THE POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

IN THE MATTER OF:	)	
	)	
TRIENNIAL REVIEW OF WATER	)	**R11-18**
QUALITY STANDARDS FOR BORON,	)	**(Rulemaking – Water)**
FLUORIDE AND MANGANESE;	)	
AMENDMENTS TO 35 ILL. ADM. CODE	)	
302.SUBPARTS B, C, E, F AND 303.312	)	

NOTICE OF FILING

To:

John T. Therriault
Clerk of the Board
Illinois Pollution Control Board
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Kathleen Crowley
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Please take notice that on June 13, 2011, I filed with the Office of the Clerk of the Illinois Pollution Control Board the attached **QUESTIONS OF THE CITY OF SPRINGFIELD, OFFICE OF PUBLIC UTILITIES, FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY WITNESS BRIAN KOCH,** a copy of which is served upon you.

Respectfully submitted,

THE CITY OF SPRINGFIELD,
a municipal corporation

By _____
One of its Attorneys

Dated: 6/13/11

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Special Assistant Corporation Counsel
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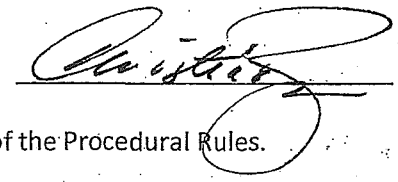
CERTIFICATE OF SERVICE

The undersigned, an attorney, certifies that on June 13, 2011, I have filed electronically the attached **QUESTIONS OF THE CITY OF SPRINGFIELD, OFFICE OF PUBLIC UTILITIES, FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY WITNESS BRIAN KOCH** upon John Therriault, Assistant Clerk, and by First Class Mail, postage prepaid, a true and correct copy to the individuals named on the foregoing Notice of Filing on June 13, 2011, from Springfield, Illinois.



This filing uses recycled paper as defined in Subpart B of the Procedural Rules.

BEFORE THE POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

IN THE MATTER OF:	)	
	)	
TRIENNIAL REVIEW OF WATER	)	R11-18
QUALITY STANDARDS FOR BORON,	)	(Rulemaking – Water)
FLUORIDE AND MANGANESE;	)	
AMENDMENTS TO 35 ILL. ADM. CODE	)	
302.SUBPARTS B, C, E, F AND 303.312	)	

QUESTIONS OF THE CITY OF SPRINGFIELD, OFFICE OF PUBLIC UTILITIES, FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY WITNESS BRIAN KOCH

The City of Springfield, Office of Public Utilities, d/b/a City Water, Light and Power ("CWLP"), by its attorney, Christine Zeman, Special Assistant Corporation Counsel, submits the following questions based upon the Proposed Amendments to 35 Ill. Adm. Code Parts 302, Subparts B, C, E and F, the Statement of Reasons and its Attachments, and the Testimony of Brian Koch submitted by the Illinois Environmental Protection Agency ("Agency" or "Illinois EPA") in this rulemaking proceeding.

CWLP's questions are organized in an outline format under topical headings based on issues raised principally by the proposed amendments to the Water Quality Standards ("WQS") for boron.

In an effort to facilitate the Agency's preparation of responses, citations to specific pages or relevant language from the Agency's Proposed Rules, Statement of Reasons and/or Witness Testimony are provided. CWLP further requests that the Hearing Officer allow follow-up questioning to be posed based on the answers provided.

QUESTIONS

I. General Witness Background

1. What role did you have in developing the Agency's Statement of Reasons?

2. The Statement of Reasons references specific Site Specific Rulemakings and Adjusted Standards, for example as to boron, beginning at page 28 – 32. Did you read each Opinion and Order of the Board cited at page 28 – 32?

3. What role did you have in developing the Agency's Attachment 1 to the Statement of Reasons, *Facts in Support of Changing Water Quality Standards for Boron, Fluoride, and Manganese?*

II. Statutory Basis and Legal Framework

A. In its Statement of Reasons at page 1, the Illinois EPA references that its proposal to revise the water quality standards (including for boron) is a culmination of the Illinois EPA's obligation to conduct a "triennial review" under the Federal Water Pollution Control Act (a/k/a "Clean Water Act").

1. Is it the position of the Illinois EPA that it is only obligated to conduct a "triennial review" of water quality standards under federal law, or also under the Illinois Environmental Protection Act?

B. In its Statement of Reasons at page 2, the Illinois EPA references that its responsibilities under Section 4 (l) of the Illinois Environmental Protection Act include "to transmit the standards adopted by the Board to the United States Environmental Protection Agency ("U.S. EPA") for approval where required by federal law. 415 ILCS 5/4(l)."

1. Does the Illinois EPA take the position that federal law requires the Board to adopt a water quality standard for boron?

2. Does the Illinois EPA take the position that state and/or federal law requires the Board to adopt both an acute and chronic water quality standard for boron?

3. On what basis did Illinois EPA determine to propose a chronic standard for boron, where one does not presently exist?

4. Did the Illinois EPA consider any other state's standards for boron in developing its proposed acute and chronic standards for boron here?

5. What other states have a boron effluent or water quality standard?

6. How does the acute and chronic standard for boron proposed by the Illinois EPA compare to the boron standards of other states?

a) For Midwest states, are there any with a chronic standard at 7.4 mg/L (or lower), as proposed by Illinois EPA here?

b) For any Midwest state with a chronic standard, if known, is the standard "Aquatic Life-Based" or based upon the U.S. EPA *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organism and Their Uses* ("the 1985 Guidelines")?

7. In its Statement of Reasons at pages 2 – 3, the Illinois EPA references the following language from Section 27(a) of the Illinois Environmental Protection Act, which identifies the criteria that the Board is required to take into account in this rulemaking: "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. 415 ILCS 5/27(a)." For the proposed boron standards, please provide the following information:

a) Has the Illinois EPA reviewed "the character of the area involved" and, if so, please provide the information the Agency has on the character of the area involved.

b) Illinois EPA states at page 2 of the *Facts in Support of Changing Water Quality Standards for Boron* (Attachment 1 of the Statement of Reasons) that treatment to remove boron in the sources identified is "non-existent" and in the Statement of Reasons at pages 25 – 26, that as to boron (and fluoride) in every site-specific water standard or adjusted standard brought before the Board, Illinois EPA concluded that no reasonable treatment exists to reduce boron in effluent. Is it now also the conclusion of the Illinois EPA that no reasonable treatment exists to reduce boron in effluent, and that boron removal technologies are "non-existent"?

c) What additional information did the Illinois EPA review in determining the technical feasibility of reducing boron, if any? Please provide any additional information the Agency used in determining the technical feasibility of reducing boron.

III. Development of the Proposed Water Quality Standards for Boron

A. The prefiled *Testimony of Brian Koch* references that literature reviews were conducted in the development of the proposed water quality standards for boron. Did you participate in the literature review as to boron?

B. How did the Illinois EPA utilize the literature reviews in the development of the proposed boron WQS?

1. If you know, did any literature reviews suggest that a chronic limit for boron could be higher (or less stringent) than the proposed chronic boron standard of 7.4 mg/l?

2. If so, what study made such suggestion and how was that study used or considered, if at all, in the development of the proposed chronic standard for boron here?

C. U.S. EPA's 1985 Guidelines, Attachment 1, Exhibit F to the Illinois EPA's Statement of Reasons appears to discuss how to determine the appropriate averaging period at around pages 7-11 in part to take into consideration the "fluctuating concentrations that usually exist in the real world". The Guidance references developing this period in relation to the Criterion Continuous Concentration or "CCC" (at page 8) suggesting that a four-day average allows waste treatment facilities to consider the probability of an exceedence of the average into the design of the waste treatment plant (at page 11). But Illinois EPA's *Facts in Support* references that boron is not generally an issue for sewage waste treatment facilities ("...sewage treatment plant effluents generally have boron concentrations of between 0.01 and 0.05 mg/L boron") and states that treatment for boron is "non-existent" (at page 2).

1. Did the Illinois EPA determine to utilize a "four day average" ("the arithmetic average of at least four consecutive samples collected over any period of at least four days") in developing the proposed chronic standard for boron because it is already referenced in 302.208(b) or did it make a specific determination that a four-day average was appropriate for boron?

2. If it specifically determined that a four-day average is appropriate for boron, how did it make that determination (given that U.S. EPA Guidelines suggest that the four-day average is to enable the average to be considered in the design of a waste treatment plant)?

3. U.S. EPA's 1985 Guidelines also suggest (at page 10) that the four-day average is appropriate for use with the CCC. Did the Illinois EPA develop a CCC in its study of boron to support its proposed chronic standard using a four-day average?

4. U.S. EPA's Guidelines discuss exceedences of the developed standard being (in part) the result of usual or random variations in the flows of both the effluent and the receiving water, and state that "most aquatic ecosystems can probably recover from most exceedences in about three years" (at page 12), allowing for more local or site-specific criterion when adequately justified, to include site-specific "frequencies of allowed exceedences". Did the Illinois EPA include "frequencies of allowed exceedences" in developing the proposed boron WQS?

IV. Impact of Proposed Boron Standards

A. Technical Feasibility and Economic Justification

1. In both the Statement of Reasons (page 27) and the Conclusion in your prefiled Testimony, the Agency claims that its proposed standards are economically reasonable and technically feasible because the proposed standards would not "result in the need to implement treatment technologies beyond those required by the existing regulations," and because the proposed rules "do not seek to establish specific effluent standards," while still serving "to effectively protect the designated uses of all associated waters." Your Testimony references no specific facilities that these statements would not cover, but the Agency's *Facts in Support* reference that coal ash is an important source of boron, and that coal ash ponds may contain boron concentrations approaching 20 mg/L. (at page 2).

a) As to boron, did the Illinois EPA rely not only on the Board Opinions and Orders in the Site Specific Rulemakings and Adjusted Standards referenced at pages 28-32 of the Statement of Reasons to reach this conclusion, but also the records in those boron rulemaking proceedings?

b) One Adjusted Standard relied upon by the Illinois EPA is the Adjusted Standard from the boron standard, then at 302.208(e), for Sugar Creek below Spaulding Dam, due to CWLP's discharge from its coal ash ponds causing or contributing to an exceedence of the boron WQS in 1994, is that correct?

c) The Illinois EPA appears to base its conclusion that the proposed boron standards are economically reasonable and technically feasible on four classes of facilities: those that currently meet the existing boron WQS, three facilities granted Board relief that is less stringent than the proposed chronic boron standard, four facilities where Discharge Monitoring Reports demonstrate that the chronic standard will be met, and a fourth class, where the boron relief granted by the Board will still be necessary.

1) When filed, the Statement of Reasons at pages 31 – 32 identifies only the CWLP facility (and the impacted segment of Sugar Creek from Spaulding Dam to the Sewage Treatment Plant) in the fourth category "based upon its initial investigations" is that correct?

2) To the best of your knowledge and based upon any investigations of the Illinois EPA since the Statement of Reasons was filed, is CWLP still the only facility in that last category, that is, that the relief previously granted by the Board will not become moot?

3) Other than CWLP, are there any other facilities that were granted relief from the Board for boron that discharge into a 7-day, 10-year low flow stream?

d) One of the facilities identified by the Illinois EPA at page 31 of the Statement of

Reasons in the third class, that is, those whose DMRs demonstrate the relief will become moot, is the Spring Creek Sanitary Treatment Plant of the Springfield Metro Sanitary District, is that correct?

1) Did the review of the DMRs (and related permits) of the Springfield Metro Sanitary District by the Illinois EPA demonstrate that CWLP has implemented the diversion of its waste water stream to the Sanitary District's Spring Creek Plant, as proposed in R09-8?

a) In R09-8, CWLP was a joint petitioner who requested relief to enable the Spring Creek Plant to accept CWLP's pretreated industrial effluent stream from it Flue Gas Desulphurization System ("FGDS") blowdown, which went to its ash ponds, because CWLP had exceeded the boron limit approved by the Board in the Adjusted Standard when it began operating its air pollution control systems for NO_x removal in 2003. Is that generally accurate?

b) In seeking relief from the Board to enable diverting this FGD waste water stream from its ash pond and outfall in R09-8, CWLP sought to meet the 11 mg/l for Sugar Creek granted by the Board in the Adjusted Standard in 1994, just as it had before it began operating its air pollution systems for NO_x control. Is that generally accurate?

2) In the record in R09-8, CWLP included evidence addressing CWLP's boron mitigation efforts, which included the costs and effectiveness of the alternatives, including a *Boron Mitigation Options Table*. The Table (Attachment G to Petitioners' Post-Hearing Document Submittal) is attached. Do you recall reviewing this Table at any time prior to today's testimony?

2. Given that the Agency has determined that technology to reduce boron is non-existent, with CWLP's demonstration of the alternatives and costs to meet the existing boron standard in the Adjusted Standard and in R09-8, and the Agency's statement that CWLP will yet need relief from the proposed boron standard, can the Agency state that as to CWLP, the proposed boron standard is not economically reasonable or technologically feasible?

3. If not, please explain the Agency's response.

Respectfully submitted,

THE CITY OF SPRINGFIELD,
a municipal corporation

By _____
One of its Attorneys

Dated: 6/13/11

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BORON MITIGATION OPTIONS TABLE

Treatment Technology	Cost			Reason For Not Implementing	Discussion
	Present Value ($)	Capital Cost ($)	O&M Cost ($)		
Brine Concentrator followed by Spray Dryer	$22,100,000	$8,222,000	$798,539	Technology was attempted. See discussion included in "pilot plant" below.	CWLP entered a contract with Aquatech International Corporation to provide a Zero Liquid Discharge Brine Concentrator/Spray Dryer System in December 2005. See the discussion below for the results of this pilot plant test. Costs cited are for comparative purposes only and do not include site preparation (site grading, providing utilities, etc.) or disposal of wastes generated by the process. Present Value assumes Annual O&M Costs escalate by $40,000/year; calculation also assumes power plant life of 30 years and an interest rate of 8 percent.
Reverse Osmosis followed by Crystallizer and Spray Dryer	$25,600,000	$6,120,000	$1,118,649	Not selected for pilot plant test based on cost and operational issues with high concentrations of salts and suspended solids in the waste stream.	Reverse Osmosis technology is currently not considered to be a viable technology for this application and is no longer marketed by the vendor to remove high concentrations of boron in liquid waste streams. Costs cited are for comparative purposes only and do not include site preparation (site grading, providing utilities, etc.) or disposal of wastes generated by the process. Present Value assumes Annual O&M Costs escalate by $56,000/year; calculation also assumes power plant life of 30 years and an interest rate of 8 percent.
Electrocoagulation (EC)	$254,000,000	$9,207,000	$14,074,000	Not selected for pilot plant test based on high cost relative to low boron removal efficiencies.	Targeting boron in FGDS wastewater specifically for removal by EC is difficult because boron is known to exist in at least six pH dependent species in water. Additionally, competing reactions from other FGDS wastewater constituents was expected to dramatically lower boron removal. It was concluded that boron removal efficiency could not be predicted due to lack of verified boron removal efficiencies in high boron and high TDS waters. An on-site small scale test was performed with no success of demonstrating the removal of boron. Costs cited are for comparative purposes only and do not include site preparation (site grading, providing utilities, etc.) or disposal of wastes generated by the process. Present Value assumes Annual O&M Costs escalate by $700,000/year; calculation also assumes power plant life of 30 years and an interest rate of 8 percent.
"Pilot Plant" Brine Concentrator/ Spray Dryer System	$104,500,000	$40,000,000	$3,700,000	Increased cost and uncertainty in how to dispose of solid waste generated by treatment process.	As detailed design of the Brine Concentrator/Spray Dryer system progressed, it became apparent that the FGDS blowdown water was a unique application of this technology. This relatively unique application translated into design changes and increased cost as the project progressed. The question of how to dispose of large quantities of solid waste generated was never resolved; therefore, the cost of waste disposal is not included in the referenced costs. Present Value assumes Annual O&M Costs escalate by $185,000/year; calculation also assumes power plant life of 30 years and an interest rate of 8 percent.

Alternative Operational Modifications	Reason For Not Implementing	Discussion
Alternative Coal Supply	Economic analysis favored continued use of Illinois coal.	Studies showed that continued use of Illinois coal was the lowest cost long term solution; resulted in economic benefits for Springfield and the State of Illinois; took advantage of CWLP's experience operating and maintaining FGDS systems; as well as avoiding major plant equipment and railway modifications and concerns about handling explosive dust. See section 6.1 on pages 6-1 through 6-3 of the TSD.
Convert to Dry Ash Systems	Will not reduce boron in the wastewater generated by the air pollution control systems that are the subject of this site-specific boron standard.	Conversion to a dry ash system has been studied by CWLP; however, the particular waste stream that is the subject of this technical support document is generated by the air pollution control equipment and would not be eliminated by modifying the plant ash handling system. The new Dallman Unit 4 will include dry fly ash and bottom ash handling systems. See section 6.2 on pages 6-3 through 6-5 of the TSD.

Alternative Operational Modification	Cost			Reason For Implementing	Discussion
	Present Value ($)	Capital Cost ($)	O&M Cost ($)		
Pretreatment/Discharge to SMSD	$36,100,000	$15,500,000	$1,600,000	Pretreatment and Discharge to the SMSD Spring Creek Plant is proposed for implementation.	SMSD has entered into a contract with CWLP to accept the FGDS wastewater stream for a price of $100,000/month provided that acceptance of the wastewater does not upset normal Spring Creek Plant operations. CWLP intends to treat the FGDS waste stream with conventional treatment process for solids removal prior to pumping the wastewater to the SMSD Spring Creek Plant. CWLP is also providing a chemical feed system to control odor to the SMSD plant. See section 6.4 on pages 6-13 through 6-14 of the TSD. The capital cost includes the pretreatment system and the pipeline to transfer the pretreated FGDS wastewater and chemical feed system(s) to control odor to the SMSD Spring Creek Plant. Present Value assumes a fixed monthly payment to SMSD, with other operating and maintenance costs escalating by $10,000 per year, a pretreatment system life of 30 years and an interest rate of 8 percent.

ATTACHMENT G

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May 23, 2011 (Table revised 5/25/2011)

Clerk's Office
Illinois Pollution Control Board
100 W. Randolph, Suite 11-500
Chicago, IL 60652

Re: R11-18, Triennial. Review of Water Quality Standards for Boron, Fluoride and Manganese

To whom it may concern:

Pre-Filed Testimony from James L. Machin, P.E. on Behalf of Marathon Petroleum Company, LP, to be Submitted to the Illinois Pollution Control Board on the Illinois Environmental Protection Agency (IEPA) Proposed Fluoride Water Quality Standard

Marathon supports the proposed amended rule to the General Use Water Quality Standards particularly as relates to fluoride, 35 IAC Sec. 302.208. This will establish variable acute and chronic instream water quality (WQ) standards for fluoride based on the hardness of the receiving water.

History of Fluoride Standards

The proposed revisions to the existing boron, fluoride, and manganese WQ standards are the result of new findings regarding the aquatic life toxicity of these substances and the influence of water chemistry on toxicity. The standard of 1.4 mg/L fluoride ("old standard") was adopted in 1972 based on opinions expressed in a 1963 literature survey conducted by the California State Water Quality Control Board and does not necessarily reflect actual toxicity in the environment. Still, fluoride was reported in this document to kill trout at concentrations ranging from 2.3 to 7.2 mg/L (McKee and Wolf, 1963), which is considerably higher than the old standard, and more in line with the proposed new standard. The authors reportedly emphasized in the foreword that the publication merely served as a survey and evaluation of the existing literature and that it should not be used to establish specific standards for the State of California or the Public Health Service.

Since then, additional studies and research based on U.S. Environmental Protection Agency guidelines have demonstrated that a sliding scale based on hardness with a maximum chronic limit of 4.0 mg/L ("new standard") is more appropriate for protection of aquatic organisms. These studies were conducted using classic dose-response bioassay tests. It is apparent that the toxicity of fluoride to aquatic life is diminished in response to increased water hardness.

In Illinois, public water utilities are required to fluoridate between 0.9 and 1.2 mg/L for human health benefits. This water is normally discharged to streams by wastewater treatment plants, leaving very little room for any additional fluoride contribution from natural or other sources to meet the current (old) standard.

We would like to add that IEPA has done an excellent job in researching and developing the proposed new standard and is to be commended for their efforts.

Standards in Other Jurisdictions

We researched the existing fluoride water quality standards in all states contiguous with Illinois, some other Midwestern states, and selected other states far removed from Illinois. Table 1 summarizes those standards. As shown, 4.0 mg/L is the most common fluoride standard, similar to the proposed new standard. Some are higher. In only one case other than irrigation is there a standard of 1.4 mg/L or lower.

Schedule

Marathon is particularly concerned about the schedule for implementation of the new WQ standard for fluoride as related to its NPDES permit. Marathon's current permit contains a fluoride effluent limitation of 1.4 mg/L, which is based on the old standard. In December 2010, Marathon received a permit modification that allows for a 15-month time period to achieve compliance with the permit-specified effluent limitation of 1.4 mg/L. The 15-month schedule includes milestones for design, construction, and operation of measures to reduce fluoride concentrations in the effluent. Marathon has already implemented several procedures to reduce fluoride concentration in their effluent, including establishing an NPDES Compliance Team that meets monthly to address fluoride and related issues. The team has already implemented several process and pollution prevention initiatives to reduce fluoride in the wastewater system.

The new standard would result in an effluent limitation that Marathon could meet. However, if the new standard is not promulgated in a timely manner, further reduction could require treatment that would be extremely expensive, and unnecessary in light of the proposed new standard. Consequently, Marathon could then be in a position of potential non-compliance with permit limits based on an old WQ standard that is scheduled to be replaced. Marathon wants to maintain an excellent compliance record and does not want to be facing potential permit violations because of delay in promulgation of the new standard.

Marathon requests that consideration of this standard change be completed as expeditiously as possible so that it can adequately plan and avoid potential permit non-compliance.

Table 1. Water Quality Standards in Other Jurisdictions (rev. 5/25/11)

JURISDICTION	AQUATIC LIFE (mg/L)		OTHER (mg/L)	OTHER USE
	Acute	Chronic		
Alaska[13]	none		4.0	Public Drinking Water
			1.0	Irrigation Water
EPA	none[1]		4.0[2]	Drinking Water Supply
Florida[3]	10.0 (fresh); 5.0 (marine)		1.5	Potable Water Supply
			1.5	Shellfish Propagation and Harvesting
			10.0	Industrial
Indiana[4]	2.0		1.0	Ohio River and Interstate Wabash River Basins
Iowa[5]	none		4.0	Potable Water Supply
Kentucky[6]	none		4.0	Drinking Water Supply
Michigan[7a]	20.0	2.7	4.0	Drinking Water Supply[7b]
Missouri[8]	none		4.0	Livestock and Wildlife Watering
			4.0	Drinking Water Supply
			4.0	Groundwater
Ohio[9]	none		2.0	Protection of Agricultural uses
Texas[10]	none		4.0	Public Drinking Water
Wisconsin	none[11]		4.0	Drinking Water[12]
			4.0	Groundwater[12]

1. EPA Recommended Water Quality Standards
2. EPA Drinking Water Standards (p. 2)
3. Florida Surface Water Quality Standards, (p. 36)
4. Indiana Water Quality Standards (pg. 7)
5. Iowa Water Quality Criteria from http://www.iowadnr.gov/water/standards/criteria.html (p.4)
6. Kentucky Surface Water Standards (p. 5)
7. Michigan
   a. Michigan Water Quality Criteria (row 283)
   b. Drinking Water Criteria adopted from EPA http://www.michigan.gov/deq/0,1607,7-135-3313_3675_3691---,00.html
8. Missouri Water Quality Criteria (p. 19)
9. Ohio Water Quality Criteria (pp. 10 and 23)
10. Texas Surface Water Quality Standards (p. 60)
11. Wisconsin Water Quality Criteria
12. Wisconsin Drinking and Groundwater Criteria http://dnr.wi.gov/org/water/dwg/health/hal.htm
13. Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (p. 17)

References

McKee, J.E. and H.W. Wolf. 1963. Water Quality Criteria, 2nd ed. California State Water Quality Control Board. Publication No. 3-A.

Sincerely,

James L. Machin, P.E.

cc: James Ellerbe, Senior Attorney, Marathon Petroleum Company, LP

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
TRIENNIAL REVIEW OF WATER QUALITY STANDARDS FOR BORON, FLUORIDE AND MANGANESE: AMENDMENTS TO 35 ILL. ADM. CODE 302.Subparts B, C, E and F and 303.312)	)	R11-18 (Rulemaking – Water)

NOTICE OF FILING

TO:

John T. Therriault, Assistant Clerk
Illinois Pollution Control Board
State of Illinois Center
100 West Randolph, Suite 11-500
Chicago, Illinois 60601

Persons included on the
ATTACHED SERVICE LIST

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board the Illinois Environmental Protection Agency's TESTIMONY OF BRIAN KOCH for the above-captioned proceeding, a copy of which is herewith served upon you.

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: Sara Terranova

Sara Terranova
Assistant Counsel
Division of Legal Counsel

DATE: 5/20/2011

Illinois Environmental Protection Agency
1021 North Grand Ave. East
P.O. Box 19276
Springfield, Illinois 62794-9276
217/782-5544

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
TRIENNIAL REVIEW OF WATER QUALITY STANDARDS FOR BORON, FLUORIDE AND MANGANESE: AMENDMENTS TO 35 ILL. ADM. CODE 302.Subparts B, C, E and F and 303.312	)	R11-18 (Rulemaking – Water)

TESTIMONY OF BRIAN KOCH

Qualifications/Introduction

My name is Brian Koch and I have been employed by the Illinois Environmental Protection Agency ("Illinois EPA or "Agency") for five years. I work as a toxicologist in the Water Quality Standards section of the Division of Water Pollution Control. I have a B.A. and M.S. in Zoology from Southern Illinois University Carbondale, with specialization in fisheries ecology and aquatic toxicology, respectively. My primary responsibility at the Agency is to derive water quality standards and criteria through the implementation of USEPA and Illinois EPA methodologies. My testimony will discuss procedures utilized in the derivation of new boron, fluoride and manganese water quality standards for General Use, Lake Michigan Basin and Public and Food Processing Water Supply designated uses. I will also discuss the corrections proposed to the General Use zinc water quality standard. The proposed water quality standards revisions for boron, fluoride, and manganese are the culmination of new toxicity data generated by the Illinois Natural History Survey (INHS) and Great Lakes Environmental Commission (GLEC), with oversight provided by Illinois EPA and USEPA. A detailed, technical discussion of the water quality standards derived from this data, as well as previously existing data compiled through an extensive literature search, is provided in the technical support

document entitled "Facts in Support of Changing Water Quality Standards for Boron, Fluoride, and Manganese". This technical support document was provided as Attachment 1 of the Agency's proposal filed December 2, 2010. My testimony will serve as an abbreviated summary of information provided within the technical support document.

Aquatic Life-Based Water Quality Standards for Boron, Fluoride, and Manganese

The existing General Use and Lake Michigan Basin standards for boron, fluoride and manganese were adopted in the Board's first standards rulemaking in 1972. In the years since their adoption, the quantity and quality of toxicity data for each substance has greatly increased, and a standardized methodology for developing scientifically based water quality standards is now available. The USEPA document entitled *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*, 1985 ("the Guidelines", Attachment 1, Exhibit F of the Agency's proposal) is used in standards development by USEPA and other states and was used by Illinois EPA to develop the proposed water quality standards for boron, fluoride, and manganese. The Guidelines is also used as a basis for procedures in 35 Ill. Adm. Code Part 302 Subpart E and Subpart F of the Board's rules used in deriving water quality criteria. The proposed standards were derived using toxicity data conducted on appropriate test organisms using acceptable test methods, appropriate laboratory waters, and proper endpoints. Test organisms were restricted to those meeting Illinois data requirements, as specified in 35 Ill. Adm. Code 302.612 (General Use waters) and 302.553 (Lake Michigan Basin waters). General Use and Lake Michigan Basin water quality standards are typically developed independent of one another, as Family

Salmonidae data is required in Lake Michigan Basin derivations but is excluded from General Use derivations. However, given the tolerance of salmonids to each substance and the intricacies of the mathematical equations within the Guidelines, the resulting Lake Michigan Basin standards were found to be less stringent than the standards developed using General Use data requirements. Given that Lake Michigan Basin methodology is intended to provide further protection to salmonids (a sensitive taxon), it is impractical to regulate Lake Michigan Basin waters with standards that are relaxed in comparison to General Use standards. Thus, we are proposing that the revised General Use standards be applied to both categories of waters.

The Guidelines allows for water quality standards to be developed independent or dependent of water quality parameters such as pH, temperature, and hardness. Literature reviews and additional laboratory tests (conducted by INHS and GLEC) studying the influence of water chemistry on boron toxicity had confounding results, therefore boron standards were developed independent of water chemistry. The acute and chronic boron standards were derived using the Final Acute Value (FAV) and Acute Chronic Ratio (ACR) methodology, respectively. The FAV is an estimation of a toxicant concentration that would be protective of at least 95% of species at the LC50 level of effect over an acute exposure period. The FAV is then divided by 2 in order to derive the acute water quality standard. This additional step is necessary to convert the FAV from an LC50 level of protection to a level that is protective at the No Observable Adverse Effect Level (35 Ill. Adm. Code 302.603). When assessing chronic toxicity, the ACR approach can be used as a means to develop a chronic standard that is linked to the corresponding acute standard. An ACR is calculated by dividing the acute LC50 of a species by the

Maximum Acceptable Toxicant Concentration (MATC, 35 Ill. Adm. Code 302.603) of the same species derived from a chronic test conducted in the same laboratory under test conditions identical to the acute test. A Final Acute-Chronic Ratio (FACR) is then calculated by taking the geometric mean of all available ACRs for each species. A chronic standard can then be obtained by dividing the FAV of a substance by the FACR of that substance. Upon compiling all of the valid boron toxicity data and following the Guidelines methodology, the resulting acute and chronic standards for boron are 40.1 mg/L and 7.6 mg/L, respectively. A thorough documentation of the toxicity data and resulting derivation of the proposed acute and chronic boron standards have been included within the narrative of Attachment 1 and Exhibits G, H, I and J of the Agency's proposal.

Given that fluoride and manganese toxicity is known to be influenced by the hardness of test water, standards for these substances were developed to account for hardness-dependent relationships. The acute standards for these substances were derived in a similar manner to the acute boron standard, with the only exception being that FAVs and resulting acute standards are hardness-based and therefore must be expressed as equations. The numerous procedures required to derive water quality dependent standards are fairly complex. However, a simplified explanation of the procedures used in deriving the acute fluoride and manganese standards is as follows. Toxicity data for each substance (from laboratory tests conducted at variable hardness) was quantified in order to determine a slope which signifies the influence of hardness on toxicity. These slopes are denoted as "*B*" in the equations that express each standard. Using the available datasets for each substance, the sensitivities of tested species were then normalized to a

hardness concentration of 50 mg/L and were ranked in order to derive an FAV at that hardness concentration. The FAV was then divided by 2 in order to derive the acute standards at 50 mg/L hardness. These values (acute standards at 50 mg/L hardness) were mathematically simplified and expressed as the intercepts "*A*" in the equations used to calculate each standard. Therefore, when a hardness of 50 mg/L is plugged into the equations for each acute standard, the resulting standards will be equal to the results of the "FAV / 2" calculations that were initially solved for each substance at a hardness of 50 mg/L. It is important to note that the hardness concentration selected for data normalization has no affect on the resulting standards, as it is merely used to normalize the data so that organism sensitivities can be ranked. A detailed documentation of the toxicity data and mathematical procedures used in deriving the proposed acute fluoride and manganese standards is provided within the narrative of Attachment 1 and Exhibits K, L, M, N, O and Q of the Agency's proposal.

Similar to boron, the chronic standard for fluoride was developed using the ACR approach, but the resulting standard is hardness-based and is expressed as an equation. The hardness-dependent chronic standard was obtained by dividing the FAV (normalized at 50 mg/L hardness) by the FACR, which gives the chronic fluoride standard at a hardness of 50 mg/L. The chronic standard equation is similar to the acute standard equation, with the one exception being that the intercept "*A*" is an expression of the chronic toxicity of fluoride rather than acute toxicity. The slope "*B*", which expresses the influence of hardness on toxicity, is the same slope that was used in the acute standard. In addition to the hardness-based chronic fluoride standard, a limit of 4.0 mg/L fluoride (on a chronic basis) has been proposed for protection of wildlife and livestock that may

utilize General Use or Lake Michigan Basin waters for watering sources. The 4.0 mg/L limit is equivalent to the safe exposure level of fluoride to humans as determined by USEPA and further detailed in the Integrated Risk Information System. The 4.0 mg/L limit would be applicable in most Illinois waters given that the hardness-based chronic standard would exceed 4.0 mg/L when calculated using average hardness concentrations of Illinois waters. Further discussion regarding the 4.0 mg/L chronic limit, as well as detailed documentation of the toxicity data and mathematical procedures used in deriving the chronic fluoride standard equation is provided within the narrative of Attachment 1 and Exhibits M and P of the Agency's proposal.

The chronic standard for manganese was developed in an alternative fashion compared to the chronic boron and fluoride standards. The standard was not developed using the ACR approach because the resulting standard was not protective of *Hyalella azteca*, the most sensitive species in the database. As stated in 35 Ill. Adm. Code 302.627(d), if a resident species whose presence is necessary for sustainment of a waterbody's ecosystem will not be protected by the calculated chronic standards then the MATC for that species should be used in developing the chronic standard. Given that this organism represents a class of benthic macroinvertebrates common in Illinois waters and is considered ecologically important, the chronic manganese standard was developed to protect at a concentration equivalent to the *Hyalella azteca* chronic MATC. This was done by replacing the FACR-based chronic intercept of 1.52 mg/L with the *Hyalella azteca* chronic MATC of 1.08 mg/L, which was further simplified and is expressed as "*A*" in the chronic standard. The slope "*B*" in the chronic standard is the same slope used in the acute standard. Further information detailing the derivation of the chronic

manganese standard is provided in the narrative of Attachment 1 and Exhibits L, N, and R of the Agency's proposal.

Aquatic toxicity results are typically reported as the total amount of toxicant present in a test, yet for metals, it is the dissolved fraction that is bioavailable for uptake across gill membranes and is the toxic component. Factors such as precipitation or sorption with suspended solids can reduce the dissolved fraction of a metal and reduce bioavailability, therefore it is necessary to measure total and dissolved metal concentrations when developing toxicity-based water quality standards. Because permit limits for dischargers are written in total form, the aquatic life standards are also listed in total form. For a substance that is always present in dissolved form (100% dissolved), the dissolved measurement of that substance is equivalent to the total measurement of that substance, therefore the total and dissolved standard would be equivalent. Such is the case for the proposed boron and fluoride standards. However, for metals such as manganese that can be found in the environment at dissolved concentrations much lower than total concentrations, a conversion factor multiplier must be incorporated into the standards in order to convert from the total standard to the dissolved standard. The conversion factor multiplier for manganese (0.9812) was derived from total and dissolved manganese data collected during the chronic *Hyalella azteca* test conducted by INHS. Further information detailing the derivation of the conversion factor multiplier used in the acute and chronic manganese standards is provided in the narrative of Attachment 1 and Exhibit T of the Agency's proposal.

Public and Food Processing Water Supply and Open Waters of Lake Michigan

There are no existing Public and Food Processing Water Supply or Open Waters of Lake Michigan standards for boron or fluoride, therefore the current General Use and Lake Michigan Basin standards for these substances are applicable in these waters and are protective of their respective uses. Given that the proposed General Use and Lake Michigan Basin standards for boron and fluoride are higher than the existing standards, and the existing standards are currently protective of Public and Food Processing Water Supply and Open Water of Lake Michigan uses, we are proposing to formally adopt the existing General Use and Lake Michigan Basin standards for boron and fluoride as Public and Food Processing Water Supply and Open Waters of Lake Michigan standards, respectively. In actuality, the 1.0 mg/L boron and 1.4 mg/L fluoride standards proposed for these waters do not reflect new standards, as the existing General Use and Lake Michigan Basin boron and fluoride standards are presently enforced in these waters.

The manganese Public and Food Processing Water Supply and Open Waters of Lake Michigan standards are presently set at 0.15 mg/L. Open Waters of Lake Michigan standards are based on background conditions of Lake Michigan rather than protection of human health or aquatic life, therefore we are not proposing to modify the existing manganese standard for these waters. Public and Food Processing Water Supply standards are intended to represent the maximum allowable concentration of a substance at the point of surface water intake that will allow for attainment of the finished drinking water Maximum Contaminant Level (MCL) for that substance following conventional treatment. The existing Public and Food Processing Water Supply and finished drinking water MCL for manganese are both set at 0.15 mg/L, therefore the existing regulations do

not account for any removal of manganese from surface waters that may occur during conventional treatment. The March 7, 1972 Board opinion (R71-14, slip opinion at page 9) provides justification for this decision, as the information available at that time did not conclude that manganese could be "substantially affected by ordinary water supply treatment". However, it is now well known that manganese can be effectively removed from surface waters via conventional treatment. Based on removal estimates within published literature, as well as data collected from conventional treatment plants in Illinois, it is apparent that >90% of manganese can be removed through conventional treatment. The newly proposed manganese Public and Food Processing Water Supply standard of 1.0 mg/L will allow for attainment of the 0.15 mg/L finished drinking water MCL for manganese following conventional treatment and will therefore be protective of Public and Food Processing Water Supply Use. Detailed documentation of the effectiveness of conventional treatment on manganese removal is provided in the narrative of Attachment 1 and Exhibit E of the Agency's proposal.

Correction to the Chronic Zinc Water Quality Standard

The existing General Use chronic aquatic life standard for zinc is hardness-based (See 35 Ill. Adm. Code 302.208(e)) and was adopted in the R02-11 rulemaking. Unbeknownst at that time, the data initially filed with the Board and used in deriving the standard contained an error. The MATC for *Hyalella azteca* was erroneously calculated as 42.25 µg/L rather than 67.59 µg/L, as percent survival values were mistakenly used in the MATC calculation rather than the actual treatment concentrations that resulted in the percent survival effects. Given that *Hyalella azteca* was listed as the most sensitive organism in the chronic database, the erroneous MATC value had a substantial affect on

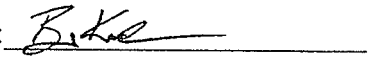
the resulting standard. At a hardness of 50 mg/L, the current standard is 12.16 µg/L, whereas the corrected standard would be 17.62 µg/L. Because the current chronic zinc standard is not representative of the true dataset, we are proposing to correct the standard by applying the proper MATC for *Hyalella azteca*. Given this recalculation, the equation representing the standard must be modified to include the appropriate intercept ("*A*" = -0.4456), while the slope ("*B*" = 0.8473) remains unchanged. A detailed documentation of the error and associated correction to the existing standard is provided within the narrative of Attachment 1 as well as the associated Exhibits V, W, and X.

Conclusions and Recommended Standards

The Agency does not believe this rulemaking will result in the need to implement additional treatment technologies beyond those required by the existing regulations; therefore it is technically feasible and economically reasonable. This rulemaking does not seek to establish any specific effluent standards or other requirements targeted at specific facilities or classes of facilities. There will be no impact on those facilities currently in compliance with the existing standards for boron, fluoride, manganese, and zinc. Several facilities that cannot comply with existing standards for boron, fluoride manganese and zinc have the potential to benefit from the rulemaking. The Agency sufficiently conducted outreach to stakeholders by sharing a draft of the rulemaking proposal, holding a meeting to present the components of the draft rulemaking and interacting in a question and answer session, accepting written comments, and emailing updates on modifications to the proposal.

The Agency believes that implementation of the proposed numeric standards for boron at 35 Ill. Adm. Code 302.208(g) and 302.504(a) and the hardness-dependent

standards for fluoride and manganese at 35 Ill. Adm. Code 302.208(e) and 302.504(a) will provide appropriate protection for the designated uses of General Use and Lake Michigan Basin waters. Likewise, modification of the chronic zinc standard to reflect the true chronic database will now allow for proper regulation of this substance in General Use waters. Additionally, appropriate protection of Public and Food Processing Water Supply use and Open Waters of Lake Michigan use will be achieved by inclusion of the proposed boron, fluoride, and manganese standards at 35 Ill. Adm. Code 302.304 and 302.504(c), respectively. The Agency believes that all proposed standards are scientifically justified and will serve to effectively protect the designated uses of all associated waters. This concludes my pre-filed testimony. I will be supplementing the testimony as needed during the hearing and would be happy to address any questions.

By: 

Brian Koch

May 19, 2011

Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

ILLINOIS POLLUTION CONTROL BOARD
May 3, 2011

ORIGINAL

IN THE MATTER OF:

TRIENNIAL REVIEW OF WATER QUALITY STANDARDS FOR BORON, FLUORIDE AND MANGANESE: AMENDMENTS TO 35 ILL. ADM. CODE 302.SUBPARTS B, C, E, F AND 303.312

R11-18
(Rulemaking - Water)

NOTICE OF HEARING

DATES, TIMES, PLACES:

Tuesday, June 21, 2011 9:00 a.m. Illinois Environmental Protection Agency Office Sangamo Training Room 1021 N. Grand Avenue East Springfield, IL	Tuesday, July 26, 2011 11:00 a.m. JAMES R. THOMPSON CENTER Room 2-025 100 W. Randolph St. Chicago, IL
PURPOSE OF HEARING:	Merit and economic
ATTENDING BOARD MEMBER:	Carrie Zalewski
HEARING OFFICER:	Kathleen M. Crowley

HEARING OFFICER ORDER

Procedural History

On December 2, 2010, the Illinois Environmental Protection Agency (Agency or IEPA) filed a rulemaking proposal for amendments to the Board's water quality standard (WQS) rules pursuant to the general rulemakings provisions of Section 27 of the Illinois Environmental Protection Act (Act), 415 ILCS 5/27 (2008) and the Boards procedural rules at 35 Ill. Adm. Code 102. In a December 16, 2011 order, the Board accepted the proposal for hearing.

In the Statement of Reasons (SR) accompanying the proposal, the Agency stated that this is the culmination of the "triennial review" of standards required by the Federal Water Pollution Control Act (FWPCA or Clean Water Act), 33 USC 1313. SR at 1. The proposal "includes updated [WQS] for boron, fluoride and manganese and a handful of clean-up amendments and updates to [35 Ill. Adm. Code] Part 302 ...and a repeal of Section 303.312." SR at 1-2.

In compliance with the Americans With Disabilities Act and other applicable federal and State laws, the hearings will be accessible to individuals with disabilities. Persons requiring auxiliary aids should contact John T. Therriault, Assistant Clerk of the Board, 100 West Randolph Street, Suite 11-500, Chicago, Illinois 60601, at telephone number (312) 814-3620, or TDD number (312) 814-6032, at least five days before the particular hearing.

The Agency proposes updates to the boron, fluoride, and manganese WQS, both as to the General Use standard in 35 Ill. Adm. Code 302.208 itself as well as to the Public and Food Processing Water Supply standards in 35 Ill. Adm. 302.Subpart C and 302.Subpart F. The Agency proposes to make changes in boron, fluoride, and manganese standards as set forth in the Statement of Reasons at pp. 4-6. In PC #1 filed January 18, 2011 at p. 2, the Agency has presented the existing standards and the proposed changes in tabular form, which it is prepared to address as hearing, to replace those contained in the Board's December 16, 2011 order. (The Agency proposal, Statement of Reasons, and PC #1 are available on the Board's Web site at www.ipc.state.il.us.)

The Hearings

The Board will conduct two hearings in order to allow the proponent and any other interested participants the opportunity to present testimony on the merits and economic impact of the rulemaking proposal. At hearing, all persons who testify will be sworn in and subject to questioning.

As indicated above in the notice of hearings, the first hearing will begin on Tuesday, June 21, 2011 and will continue until the day's business is completed, but in no event later than 5:00 p.m. The second hearing is scheduled to begin Tuesday July 26, 2011 and will continue until the day's business is completed, but in no event later than 4:30 p.m. However, given the hearing officer's present inability to assess the length of these hearings, and potential participants are advised to arrive in timely fashion, as the hearings will be adjourned when no one present wishes to present testimony or ask questions.

Pre-Filing Deadlines

Participants who intend to testify must pre-file their testimony and serve the testimony on the hearing officer and all persons on the Service List. Before filing pre-filed testimony or any other document with the Clerk, please check for the most recent version of the Service List with the hearing officer or the Clerk's Office.

Participants in the first hearing on June 21, 2011 are directed to pre-file all of their testimony and any related exhibits no later than Monday, May 23, 2011. Under Section 27 of the Act (415 ILCS 5/27 (2006)), the first hearing is not limited to the testimony of the proponent. But, the hearing officer presently intends to allow the Agency as proponent to present the testimony of all of its witnesses before hearing the testimony of other participants. Therefore, any other person wishing to testify at the first hearing should also pre-file their testimony by May 23, 2011. To further maximize hearing efficiency, participants are requested to review testimony pre-filed by others, and to pre-file questions concerning that testimony on or before Monday, June 13, 2011.

Participants wishing to testify at the second hearing on July 26, 2011 are directed to pre-file all of their testimony and any related exhibits no later than Friday, July 8, 2011. Participants are again requested to review testimony pre-filed by others, and to pre-file questions concerning that testimony on or before Thursday, July 21, 2011.

The "mailbox rule" at 35 Ill. Adm. Code 101.300(b)(2) does not apply to the filing of this pre-filed testimony, and the Board's Clerk must therefore receive these documents before the close of business on the specified dates. However, pre-filed testimony and other documents may be filed electronically though the Clerk's Office On-Line (COOL) from the Board's Web site at www.ipcb.state.il.us. Any questions about electronic filing through COOL should be directed to the Clerk's Office at (312) 814-3629.

Order of Hearings

All pre-filed testimony will be entered into the record as if read, unless unanticipated circumstances dictate otherwise. *See* 35 Ill. Adm. Code 102.424(f). A brief summary of testimony will be allowed if a witness wishes to provide one before responding to questions. Participants who do not pre-file testimony will be allowed to testify as time permits only after the conclusion of pre-filed testimony and questions based upon it. Similarly, any participant who wishes to offer a public comment will be allowed to do so as time permits at the close of pre-filed testimony and the questions based upon it. Consequently, any person wishing to testify at either of the two hearings is urged to pre-file their testimony in order to ensure that they have an opportunity to testify. In addition, the Board's procedural rules provide that "[t]he Board will accept written comments from any person concerning the proposed regulations during the first notice period." 35 Ill. Adm. Code 102.604.

The hearing scheduled to begin on June 21, 2011, will begin with the Agency's presentation of its case as the proponent. After the Agency has answered all questions from other participants, and if time permits before the conclusion of the first hearing, other persons who have pre-filed may testify. Based on the information currently available, the hearing officer believes she has reserved sufficient time for each hearing and anticipates that any person who wishes to testify will have an opportunity for testimony and any cross-examination. In the event that any person who pre-files testimony for the first hearing cannot testify on June 21, 2011, because time does not allow it, that person will be given priority to testify on July 26, 2011. Persons who pre-file questions will be given priority in questioning other participants.

The July 26, 2011 hearing will begin with any testimony from any participant who pre-filed testimony for the first hearing and who was not able to testify at that time. Participants who pre-filed testimony for the second hearing will then present that testimony. Persons who pre-file questions will be given priority in questioning other participants.

Any participant who wishes to offer a public comment at either hearing will be allowed to do so if time permits at the close of pre-filed testimony and the questions based upon it. Again, written public comments may be submitted to the Board. *See* 35 Ill. Adm. Code 102.604.

Finally, the hearing officer, upon agreement of the participants or upon motion to the hearing officer, may change the order of testimony at these hearings. *See* 35 Ill. Adm. Code 102.420, citing 35 Ill. Adm. Code 101.Subpart F.

Service and Notice Lists

The Board will establish a notice list and a service list for this proceeding. Persons wishing to be added to either list may contact the Clerk's Office or the hearing officer.

All persons on the notice list will receive notice of Board opinions and orders and hearing officer orders. 35 Ill. Adm. Code 102.422(a).

Under Section 102.422(b) of the Board's procedural rules,

> [t]he hearing officer may establish a service list for any regulatory proceeding, in addition to the notice list. The hearing officer may direct participants to serve copies of all documents upon the persons listed on the service list. . . . For purposes of fast-track rulemakings under Section 28.5 of the Act, participants of record will be the individuals on the service list. 35 Ill. Adm. Code 102.422(b).

In addition to receiving notice of all Board actions and hearing officer orders, persons on the service list will receive pre-filed testimony and other filings in this proceeding.

The service list is intended for persons such as those who will testify and participate actively in this rulemaking. Persons on the Service List for this rulemaking receive not only the Board's opinions and orders but also other filings such as pre-filed testimony and public comments. But, persons on the service list are also required to serve copies of the filings they make on other persons on the service list. Please note that the participants are free to waive service of hard copy of documents and to receive service only by electronic means: counsel for one law firm, Schiff Hardin, has already done so in this proceeding by filing of April 14, 2011.

Interested persons may now request electronic notice of filings by providing their e-mail address through COOL under this docket number: R11-18. This electronic notice includes notice of the filing of documents that are not typically provided to persons on the Notice List. In addition, COOL provides links to documents filed with the Board, and those documents can be viewed, downloaded, and printed free of charge as soon as they are posted to the Board's Web site. For more information about the option of electronic notice or COOL, consult either the Board's Web site at www.ipc.state.il.us or John Therriault, the Board's Assistant Clerk, at (312) 814-3629.

At the close of the second hearing, the hearing officer will set a date by which the record will close and all public comments must be submitted. *See* 35 Ill. Adm. Code 102.108. As the Board is aware that the Agency would appreciate Board decision making as soon as possible, the post-hearing comment period will not be lengthy unless unanticipated circumstances dictate otherwise.

IT IS SO ORDERED.

Kathleen M. Crowley

Kathleen M. Crowley
Hearing Officer, Illinois Pollution Control Board
100 West Randolph Street, Suite 11-500
Chicago, Illinois 60601
(312) 814-6929 crowlek@ipcb.state.il.us

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
TRIENNIAL REVIEW OF WATER QUALITY STANDARDS FOR BORON, FLUORIDE AND MANGANESE: AMENDMENTS TO 35 ILL. ADM. CODE 302.Subparts B, C, E and F and 303.312	)	R11-18 (Rulemaking – Water)

pc#1

NOTICE OF FILING

John Therriault, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, Illinois 60601

Andrew Armstrong
Assistant Attorney General
Environmental Bureau
69 W. Washington Street, Suite 1800
Chicago, Illinois 60602

Kathleen Crowley, Hearing Officer
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, Illinois 60601

PLEASE TAKE NOTICE that I have filed today with the Office of the Clerk of the Illinois Pollution Control Board the Pre-Hearing Comments of the Illinois Environmental Protection Agency, a copy of which is herewith served upon you.

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: _____
Deborah J. Williams
Assistant Counsel

1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
(217) 782-5544

Dated: January 14, 2011

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
TRIENNIAL REVIEW OF WATER QUALITY	)	R11-18
STANDARDS FOR BORON, FLUORIDE	)	(Rulemaking – Water)
AND MANGANESE: AMENDMENTS	)	
TO 35 ILL. ADM. CODE 302.Subparts B, C, E	)	
and F and 303.312	)	

PRE-HEARING COMMENTS OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

On December 2, 2010, the Illinois Environmental Protection Agency ("Illinois EPA" or "Agency") filed a rulemaking proposal with the Pollution Control Board ("Board") in the above-captioned proceeding containing proposed amendments to the Board's water quality standards regulations.

The Board found that the Illinois EPA's proposal met the procedural requirements of 35 Ill. Adm. Code 102.202 and accepted the proposal for hearing at its December 16, 2010 meeting.

Within its December 16, 2010 Opinion and Order, the Board published two tables providing summaries of the Board's existing standards for boron, fluoride and manganese and the Agency's proposed changes to those standards.

The Agency has identified errors in the two Tables and has included two corrected Tables for convenience and reference of the Board and interested stakeholders.

Table 1: Existing Water Quality Standards

Parameter	General Use	Non-open Lake Michigan Basin	Open Lake Michigan Basin	Secondary Contact and Indigenous Aquatic Life Standards*	Public and Food Processing Water Supply
Boron	1.0 mg/l	1.0 mg/l	1.0 mg/l	None set	None set**
Fluoride	1.4 mg/l	1.4 mg/l	1.4 mg/l	15 mg/l	None set**
Manganese	1.0 mg/l	1.0 mg/l	0.15 mg/l	1.0 mg/l	0.15 mg/l

*No changes are proposed to these standards in R11-18, but may be addressed in R08-09(D)

**In the absence of a Public and Food Processing Water Supply Standard, the General Use Standards of 1.0 mg/L boron and 1.4 mg/L fluoride apply to these waters. See, 35 Ill. Adm. Code 302.301.

Table 2: Illinois EPA's Proposed Water Quality Standard Changes*

Parameter	General Use and Non-open Lake Michigan Basin Acute	General Use and Non-open Lake Michigan Basin Chronic	Public and Food Processing Water Supply
Boron	40,100 µg/l	7,600 µg/l	1.0 mg/l
Fluoride	exp[A +Bln(H)] µg/l where A = 6.7319 and B = 0.5394	exp[A+Bln(H)] µg/l, but shall not exceed 4.0 mg/l where A = 6.0445 and B = 0.5394	1.4 mg/l
Manganese	exp[A +Bln(H)] X 0.9812 where A = 4.9187 and B = 0.7467	exp[A +Bln(H)] X 0.9812 where A = 4.0635 and B = 0.7467	1.0 mg/l

*Existing standards with no change proposed have been omitted from Table 2.

The Agency's technical witnesses will be available to respond to questions about

these Tables at the hearings held regarding this regulatory proposal.

Respectfully submitted,

By: _____

Deborah J. Williams
Assistant Counsel
Division of Legal Counsel

Date: January 14, 2011

Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

STATE OF ILLINOIS)
) SS
COUNTY OF SANGAMON)
)

PROOF OF SERVICE

I, the undersigned, on oath state that I have served the attached Pre-Hearing Comments of the Illinois Environmental Protection Agency upon the person to whom it is directed, by placing it an envelope addressed to:

John Therriault, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, Illinois 60601

Andrew Armstrong
Assistant Attorney General
Environmental Bureau
69 W. Washington Street, Suite 1800
Chicago, Illinois 60602

Kathleen Crowley, Hearing Officer
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, Illinois 60601

and mailing it First Class Mail from Springfield, Illinois on January 14, 2011, with sufficient postage affixed.

Kimberley Taylor

SUBSCRIBED AND SWORN TO BEFORE ME
This 14th day of January 2011

Brenda Boehner
Notary Public

"OFFICIAL SEAL"
BRENDA BOEHNER
NOTARY PUBLIC
STATE OF ILLINOIS
MY COMMISSION EXPIRES 11-14-2013

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
UPDATED WATER QUALITY	)	R11- 18
STANDARDS FOR BORON, FLUORIDE	)	(Rulemaking – Water)
AND MANGANESE: PROPOSED	)	
AMENDMENTS TO 35 Ill. Adm. Code	)	
Part 302, Subparts B, C, E and F and	)	
Section 303.312	)	

STATEMENT OF REASONS

The Illinois Environmental Protection Agency ("Illinois EPA" or "Agency") hereby submits its Statement of Reasons for the above captioned rulemaking to the Illinois Pollution Control Board ("Board") pursuant to Section 27 of the Environmental Protection Act ("Act") [415 ILCS 5/27] and 35 Ill. Adm. Code 102.200 and 102.202.

I. INTRODUCTION AND STATUTORY AUTHORITY

Pursuant to the Federal Water Pollution Control Act (hereinafter "Clean Water Act"), it is the primary responsibility of the States to set water quality standards for intrastate waters and submit changes to those standards to U.S. EPA for approval. 33 U.S.C. §1313. Clean Water Act Section 303 provides that "the State water pollution control agency . . . shall from time to time (but at least once each three year period beginning with October 18, 1972) hold public hearings for the purpose of reviewing applicable water quality standards and, as appropriate, modifying and adopting standards." 33 U.S.C. 1313(c)(1). This requirement to periodically review and update standards is commonly referred to as the "triennial review" requirement. This proposal is a culmination of the Illinois EPA's obligation to conduct a triennial review and includes updated

water quality standards for boron, fluoride and manganese and a handful of clean-up amendments and updates to Part 302 of the Board's regulations and a repeal of Section 303.312.

Section 5(c) of the Act gives the Board "authority to act for the State in regard to the adoption of standards for submission to the United States under any federal law respecting environmental protection. Such standards shall be adopted in accordance with Title VII of the Act and upon adoption shall be forwarded to the Environmental Protection Agency for submission to the United States . . . " 415 ILCS 5/5(c). The Agency is given the responsibility under Section 4(l) of the Act to transmit the standards adopted by the Board to the United States Environmental Protection Agency ("U.S. EPA") for approval where required by federal law. 415 ILCS 5/4(l).

In the provisions specific to protection of waters of the State, Section 13(a) of the Act provides that

> 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: (1) Water quality standards specifying among other things, the maximum short-term and long-term concentrations of various contaminants in the waters, the minimum permissible concentrations of dissolved oxygen and other desirable matter in the waters, and the temperature of such waters; ...

415 ILCS 5/13(a).

The contents of this regulatory proposal are within the general substantive rulemaking authority conferred upon the Board under Sections 27 and 13(a) of the Act. This proposal is also one of general applicability pursuant to Sections 27 and 28 of the Act and Section 5-40 of the Illinois Administrative Procedure Act. 415 ILCS 5/27 and 28, 5 ILCS 100/5-40, 35 Ill. Adm. Code 102.106(a)(3) and (b)(1). In evaluating these proposed rules, the Board is required to 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." 415 ILCS 5/27(a).

This Statement of Reasons will address the purpose and effect of this regulatory proposal and outline the specific amendatory language being proposed. A technical support document was prepared by the Bureau of Water in support of the proposed changes to the boron, fluoride and manganese water quality standards and is included as Attachment 1 to this Statement of Reasons.

II. REGULATORY PROPOSAL: PURPOSE AND EFFECT

A. History of the Existing Boron, Fluoride and Manganese water quality standards

The existing General Use and Lake Michigan Basin Standards for boron, fluoride, and manganese were adopted by the Board in its 1972 standards rulemaking establishing the initial Board water quality standards and have not been updated since that time. *See*, R71-14 (March 7, 1972). The existing General Use and non-open water Lake Michigan Basin standard for boron is 1.0 mg/L. The existing General Use and non-open water Lake Michigan Basin standard for fluoride is 1.4 mg/L. The existing General Use and non-open water Lake Michigan Basin standard for manganese is 1.0 mg/L.

The Open Waters of Lake Michigan standards are based on background conditions of Lake Michigan rather than protection of human health or aquatic life. The existing manganese standard is 0.15 mg/L and will remain unchanged. Presently there are no boron or fluoride standards specifically adopted for the Open Waters of Lake Michigan, therefore the existing non-open waters Lake Michigan Basin Standards for these substances are applicable in these waters.

The Secondary Contact and Indigenous Aquatic Life standards for fluoride and manganese are 15 mg/L and 1 mg/L, respectively. No standard for this designated use currently exists for boron. At this time, the Agency intends to address all standards for Secondary Contact and Indigenous Aquatic Life Use waters in the "Use Attainability Analysis of the Des Plaines and Chicago Waterways" rulemaking. *See*, R08-09 (Sub-Docket D).

There are no existing Public and Food Processing Water Supply standards for boron or fluoride, therefore the General Use standards for these substances are applicable in these waters and are protective of Public and Food Processing Water Supply use. The existing Public and Food Processing Water Supply standard for manganese is 0.15 mg/L, which is based on aesthetics rather than human health.

B. Purpose and Effect of the Proposal

1. Boron, Fluoride and Manganese Water Quality Standards

The Agency's rulemaking proposal updates the water quality standards for boron, fluoride and manganese. Changes are proposed to the General Use standard itself as well as the to the Public and Food Processing Water Supply standards in Subpart C of Part 302 and the Lake Michigan standards in Subpart E of Part 302.

With no existing Public and Food Processing Water Supply water quality standards for boron or fluoride, the existing General Use standards for these substances are applied to these waters by default. As the Board stated in R71-14 "Since general criteria apply to all waters designated for public supply, the present regulation omits separate requirements for those parameters whose general standards are tight enough to protect public supplies; boron, chromium, copper, fluoride, mercury, silver and zinc." *See*, R71-14, March 7, 1972, Slip. Op. at 9. Since the proposed new General Use standards for boron and fluoride are higher than the

existing standards of 1.0 mg/L and 1.4 mg/L, respectively, Illinois EPA is proposing to designate 1.0 mg/L boron and 1.4 mg/L fluoride as Public and Food Processing Water Supply standards. The proposed standards would be applied at the point of surface water intake and would be regulated as one-number, not to be exceeded standards. Because there are no specific Open Waters of Lake Michigan standards for boron and fluoride in Subtitle E, the Lake Michigan Basin standards for these substances are currently applicable. Relocating the existing Lake Michigan Basin standards of 1.0 mg/L boron and 1.4 mg/L fluoride into the Open Waters of Lake Michigan standards will provide a measure of protection against harmful loadings of these substances within these waters, and will continue to allow protection of these waters for Public and Food Processing Water Supply uses.

For manganese, the Public and Food Processing Water Supply and Open Waters of Lake Michigan standards are presently set at 0.15 mg/L. Open Waters of Lake Michigan standards are based on background conditions of Lake Michigan rather than protection of human health or aquatic life, therefore the existing manganese standard for these waters will remain unchanged.

Public and Food Processing Water Supply standards are intended to represent the maximum allowable concentration of a substance at the point of surface water intake that will allow for attainment of the finished drinking water maximum contaminant level ("MCL") for that substance following conventional treatment. As explained in the Agency's technical support document (Attachment 1, pages 9-12), the existing manganese Public and Food Processing Water Supply standard of 0.15 mg/L is overly protective of the finished manganese standard, as the finished MCL of 0.15 mg/L can easily be attained following conventional treatment of surface waters containing greater than 0.15 mg/L manganese. Because manganese often occurs in Illinois at concentrations above the existing water quality standards, the Public and Food

Processing Water Supply standard is exceeded in many surface waters with public water supply intakes and Illinois EPA has been forced to list these waters on the Clean Water Act Section 303(d) list and establish Total Maximum Daily Loads ("TMDL") unnecessarily for waters with naturally occurring sources of manganese that will be adequately addressed by conventional drinking water treatment. By conservatively estimating that 90% of manganese can be removed at conventional utilities in Illinois, and back-calculating the amount of manganese in surface waters that would still allow for attainment of the 0.15 mg/L finished MCL, it is apparent that a maximum surface water concentration of 1.5 mg/L would be sufficiently protective of the Public and Food Processing Water Supply use designation. However, in order to provide an additional measure of conservancy, the Agency is proposing to set the new manganese Public and Food Processing Water Supply standard at 1 mg/L (total manganese). The standard would be applied at the point of surface water intake and would be regulated as a one-number, not to be exceeded standard.

The proposed updates to the General Use and Lake Michigan Basin water quality standards for boron, fluoride and manganese were developed using U.S. EPA guidelines for deriving numerical water quality criteria. *See*, Attachment 1, Exhibit F. The U.S. EPA "1985 Guidelines" methodology is commonly used to derive state standards and U.S. EPA national criteria documents for substances that are toxic to aquatic life. This conventional methodology was used in deriving acute and chronic standards for boron, fluoride, and manganese. Given that fluoride and manganese toxicity is known to be influenced by the hardness of test water, standards for these substances were developed to account for hardness-dependent relationships. Literature reviews and additional laboratory tests studying the influence of water chemistry on

boron toxicity had confounding results, therefore boron standards were developed independent of water chemistry.

The newly derived boron, fluoride and manganese standards were the result of collaborative work between the Agency, U.S. EPA and Dr. David Soucek of Illinois Natural History Survey (INHS). A literature review compiled by the Agency determined that insufficient data was available to derive Tier I acute and chronic standards for each substance, therefore it was necessary to conduct toxicity tests to supplement the dataset for each parameter. The Agency consulted with U.S. EPA to determine which test organisms would best fill the data gaps in order to derive fully protective aquatic life standards. U.S. EPA then contracted Great Lakes Environmental Commission (GLEC) and INHS to conduct toxicity tests on boron (acute tests using the fathead minnow *Pimephales promelas* (variable pH), *Ceriodaphnia dubia*, and the freshwater mussels *Lampsilis siliquoidea*, *Ligumia recta*, and *Megalonaias nervosa*; chronic test using *Pimephales promelas*), fluoride (acute tests using the fingernail clam *Sphaerium simile* and the amphipod *Hyalella azteca*) and manganese (acute tests using *Lampsilis siliquoidea* and *Megalonaias nervosa*). *See* Attachment 6. The Agency additionally contracted INHS to conduct additional toxicity tests on boron (acute tests using the stonefly *Allocapnia vivipara*, *Sphaerium simile*, *Pimephales promelas*, the waterflea *Ceriodaphnia dubia* (variable hardness and pH) and *Hyalella azteca* (variable hardness and pH); chronic tests using *Pimephales promelas* and *Hyalella azteca*), fluoride (acute and chronic tests using *Hyalella azteca*), and manganese (acute and chronic tests using *Hyalella azteca*). *See,* Attachment 1, Exhibit U.

Standards for each substance were then developed in accordance with 1985 Guidelines methodology. The following is a general overview of the 1985 Guidelines procedures used in

deriving the proposed standards. Further detail regarding the additional procedures required for deriving the hardness-based fluoride and manganese standards is provided in Attachment 1.

Only data from toxicity tests conducted on appropriate organisms using valid test methods, appropriate laboratory waters, and proper endpoints were used in deriving the proposed standards. For each substance, acute data expressed as an LC50 (concentration lethal to 50 percent of the tested organisms) was compiled for each species and was used to develop a Genus Mean Acute Value (GMAV) for each genus. The GMAVs were ranked by sensitivity and were used to develop the Final Acute Value (FAV). The FAV is the value protective of at least 95% of species at the LC50 level of effect. The FAV was then divided by 2 in order to convert the acute value from an LC50 level of protection to a level that is protective at the no observable adverse effect level.

Chronic standards for boron and fluoride were developed using the Acute-Chronic Ratio (ACR) approach, which requires ACRs from animals in at least three different families of which one species is a fish, one species is an invertebrate, and one is an acutely sensitive freshwater species. An ACR is calculated by dividing the acute LC50 of a species by the Maximum Acceptable Toxicant Concentration (MATC) of the same species derived from a test conducted in the same laboratory under test conditions identical to the acute test. The Final Acute-Chronic Ratio (FACR) was then calculated by taking the geometric mean of all available ACRs for each species. Chronic standards were then obtained by dividing the FAV of each substance by the FACR. The chronic manganese standard was not developed using the ACR approach because the resulting standard was not protective of *Hyalella azteca*, the most sensitive species. Rather, the chronic manganese standard was based off the *Hyalella azteca* MATC to afford proper protection for this organism and other untested, closely related organisms.

The procedures used by Illinois EPA in deriving acute and chronic standards for all three parameters are described in more detail in Attachment 1.

2. Other Proposed Changes to Part 302 and 303

In addition to the updated water quality standards, the Agency is proposing a handful of minor amendments to Part 302.

a. Derived Water Quality Criteria publication requirement

In R88-21(A) the procedures in Subpart F of Part 302 for deriving site-specific water quality criteria for toxic parameters were adopted by the Board. One important procedural component of this method for establishing criteria was to require periodic public notice of the criteria that have been developed. In R97-25, parallel procedures were included in Subpart E for publication of derived criteria developed for the Lake Michigan Basin.

The Agency is required to and does publish notice of derived water quality criteria in the Illinois Register every quarter pursuant to 302.595 for Lake Michigan Basin criteria for bioaccumulative chemicals of concern and pursuant to 302.669 for all other toxicity criteria derived pursuant to Subpart F. The Agency has also maintained a list of derived criteria on its website. The Agency is proposing to simply change the required method of public notice to updating the list on its website not less frequently than quarterly, rather than requiring publication in the Illinois Register.

b. Correction to Error in Zinc General Use water quality standard derivation

The existing General Use chronic water quality standard for zinc is hardness-based and was adopted by the Board in the R02-11 rulemaking. *See, In the Matter of Water Quality Triennial Review: Amendments to 35 Ill. Adm. Code 302.105, 302.208(e)-(g), 302.504(a),*

302.575(d), 309.141(h); and Proposed 35 Ill. Adm. Code 301.267, 301.313, 301.413, 304.120, and 309.157, R02-11 (December 19, 2002). During the R02-11 proceeding, the Agency identified a number of mathematical and clerical errors in its proposal to the Board by submittal of three different Errata Sheets. *See*, Attachment 8. In Errata Sheet Number 3, the Agency addressed corrections to the zinc values in its original proposal that were eventually adopted by the Board. The Agency has discovered an additional error in the chronic water quality standard for zinc that was not identified in the R02-11 proceeding.

An error was made in regards to the chronic toxicity value reported by the Agency for *Hyalella azteca*. This value was taken from Table 2 of Borgmann et al. 1993 which is included as Attachment 1, Exhibit W to this Statement of Reasons. A transcription error resulted in the Agency using an incorrect value from that Table in its derivation of the chronic zinc water quality standard. An explanation of the error is provided on page 22 of Attachment 1 and both the incorrect and corrected values and equations are provided in Attachment 1, Exhibit X. Due to this change, the intercept value in the equation representing the chronic zinc standard must be modified from A = -0.8165 to A = -0.4456. The adopted chronic value for *Hyalella azteca* was erroneously calculated and resulted in a chronic zinc standard that was not representative of the true dataset and the Agency is proposing that the Board correct this error.

c. Elimination of STORET references

STORET is defined in Section 301.405 as "the national water quality data system of the federal Environmental Protection Agency." STORET codes, as they appear in current Board water quality standards, are no longer maintained and updated by U.S. EPA, therefore they are of little use in instructing the reader on what form of the substance is regulated. Because the STORET database is no longer being supported by U.S. EPA, the Agency is proposing to drop

STORET codes from throughout the regulations when those regulations are opened for other amendments.

d. Corrected cross-references

In developing these amendments, the Agency discovered a handful of typographical errors in cross references. Those incorrect or outdated cross-references were found in Sections 302.303, 302.553, 302.648, 302.657.

e. Language Clarification in 302.208

In addition to changes to the water quality standards in 302.208, the Agency is proposing to reorganize the language in each paragraph to more clearly identify how the acute, chronic, human health and single-value standards are interpreted. These changes generally involve splitting up the language in existing subsection (d) into the applicable language in subsections (a) through (c). In addition, language is added to subsection (d) to clarify the interpretation of the single-value standards in subsections (g) and (h). *See* below for the specific changes proposed.

f. Clarifications of references to Cyanide, Mercury, Chloride and Toluene in Tables

The Agency is proposing a handful of amendments to clarify the applicability of the water quality standards for toxic parameters. In 302.208, the Agency has proposed changing the term "metal" to "chemical constituent" to make clear that not all of the parameters regulated in that Section are metals.

For mercury and chloride, the Agency has proposed adding the phrase "(total)" following the parameter in the tables to clarify that the substance is regulated in its total form, rather than dissolved forms. For chloride, this is done to create consistency throughout the Board's water quality standard regulations. For mercury, it is done to clarify that, unlike the aquatic life standards which are based on dissolved mercury, the human health standard for mercury relies

on total mercury given the potential for total mercury to become methylated and subsequently bioaccumulate in aquatic life.

The current General Use standard does not specify the form of cyanide, but it is interpreted as allowing either of two test methods for cyanide: the weak acid dissociable (WAD) form or the available form. Currently, the Lake Michigan Basin standards in Subpart E of Part 302 refer to the weak acid dissociable (WAD) form, while the total form is used in the existing Secondary Contact and Indigenous Aquatic Life standard and the effluent standard of 0.10 mg/L. Total Cyanide refers to all of the CN groups in cyanide compounds that can be determined as the cyanide ion (CN^-). Available cyanide consists of cyanide ion (CN^-), hydrogen cyanide in water (HCN_{aq}) and the cyano-complexes of zinc, copper, cadmium, mercury, nickel, and silver. Cyanide (WAD) is the hydrogen cyanide (HCN) that is liberated from a slightly acidified (pH 4.5 to 6.0) sample under the prescribed distillation conditions. Total cyanide and cyanide (WAD) are determined using standard methods, while available cyanide methods are taken from EPA-821-R-99-013 (August 1999). The Agency is proposing clarifications in both the Lake Michigan and General Use standards that clarify that the WAD and available cyanide are the two forms of cyanide tests that may be used in assessing attainment with the General Use cyanide water quality standard.

Two minor changes are proposed to the toluene standards in Part 302.Subpart E. In 302.504(a), the table mistakenly identifies the toluene standard in milligrams per liter, rather than micrograms per liter. In addition, the toluene standard in 302.504(d) is proposed for deletion because it is less stringent than the acute standard in 302.504(a) and therefore unnecessary. In R02-11, the Board updated the toluene standard in 302.504(a) to include the acute and chronic standards of 2,000 and 610 respectively. This standard was published and adopted in error in

milligrams per liter units instead of micrograms per liter. To demonstrate that this was merely a typographical error, the Agency directs the Board to the transcript of the March 6, 2002 hearing in R02-11 where the Board questions for the Agency witnesses correctly identified the toluene standard proposed as being measured in micrograms per liter. *See*, R02-11, Hearing Transcript, March 6, 2002, pp. 104-105.

g. Repeal of Section 303.312

As explained in more detail below, the Agency has proposed repeal of a site-specific fluoride standard in 303.312 as obsolete and inconsistent with the new water quality standards.

III. REGULATORY PROPOSAL: REGULATORY LANGUAGE

The Agency is proposing additions and changes to 35 Ill. Adm. Code Part 302 and one change to Part 303. The specific Sections affected are Sections 302.208, 302.303, 302.304, 302.504, 302.553, 302.595, 302.648, 302.657, 302.669 and 303.312.

SUBPART B: GENERAL USE WATER QUALITY STANDARDS

All of the proposed language changes in Part 302, Subpart B are contained in Section 302.208. The relevant amendments are included below for reference with the exception of the deletion of STORET numbers in the Tables.

Section 302.208 Numeric Standards for Chemical Constituents

a) The acute standard (AS) for the chemical constituents listed in subsection (e) shall not be exceeded at any time except for those waters for which a zone of initial dilution (ZID) applies pursuant to Section 302.102~~as provided in subsection (d)~~.

b) The chronic standard (CS) for the chemical constituents listed in subsection (e) shall not be exceeded by the arithmetic average of at least four consecutive samples collected over any period of at least four days, except for those waters

in which the Agency has approved a mixing zone or allowed mixing pursuant to Section 302.102~~as provided in subsection (d)~~. The samples used to demonstrate attainment or lack of attainment with a CS must be collected in a manner that assures an average representative of the sampling period. For the chemical constituents ~~metals~~ that have water quality based standards dependent upon hardness, the chronic water quality standard will be calculated according to subsection (e) using the hardness of the water body at the time the ~~metals~~ sample was collected. To calculate attainment status of chronic ~~metals~~ standards, the concentration of the chemical constituent ~~metal~~ in each sample is divided by the calculated water quality standard for the sample to determine a quotient. The water quality standard is attained if the mean of the sample quotients is less than or equal to one for the duration of the averaging period.

c) The human health standard (HHS) for the chemical constituents listed in subsection (f) shall not be exceeded when the stream flow is at or above the harmonic mean flow pursuant to Section 302.658 nor shall an annual average, based on at least eight samples, collected in a manner representative of the sampling period, exceed the HHS except for those waters in which the Agency has approved a mixing zone or allowed mixing pursuant to Section 302.102~~as provided in subsection (d)~~.

d) The standard for the chemical constituents of subsections (g) and (h) shall not be exceeded at any time except for those waters in which the Agency has approved a mixing zone or allowed mixing pursuant to Section 302.102. ~~In waters where mixing is allowed pursuant to Section 302.102, the following apply:~~

~~1) The AS shall not be exceeded in any waters except for those waters for which the Agency has approved a zone of initial dilutions (ZID) pursuant to Section 302.102.~~

~~2) The CS shall not be exceeded outside of waters in which mixing is allowed pursuant to Section 302.102.~~

~~3) The HHS shall not be exceeded outside of waters in which mixing is allowed pursuant to Section 302.102.~~

e) Numeric Water Quality Standards for the Protection of Aquatic Organisms

Constituent	~~STORET Number~~	AS (μg/L)	CS (μg/L)
***			
Boron (total)		40,100	7,600

***

Cyanide (Weak acid dissociable or available)	~~00718~~	22	5.2
Fluoride (total)		$e^{A+B\ln(H)}$ where $A = 6.7319$ and $B = 0.5394$	$e^{A+B\ln(H)}$, but shall not exceed 4.0 mg/L where $A = 6.0445$ and $B = 0.5394$
Manganese (dissolved)		$e^{A+B\ln(H)}$ X 0.9812* where $A = 4.9187$ and $B = 0.7467$	$e^{A+B\ln(H)}$ X 0.9812* where $A = 4.0635$ and $B = 0.7467$
Zinc (dissolved)	~~01090~~	$e^{A+B\ln(H)}$ X 0.978*, where $A = 0.9035$ and $B = 0.8473$	$e^{A+B\ln(H)}$ X 0.986*, where ~~$A = -0.8165$~~ $A = -0.4456$ and $B = 0.8473$

***

where: $\mu g/L$ = micrograms per liter

e^x = base of natural logarithms raised to the x- power

$\ln(H)$ = natural logarithm of Hardness ~~(STORET 00900)~~

* = conversion factor multiplier for dissolved metals

f) Numeric Water Quality Standard for the Protection of Human Health

Constituent	~~STORET Number~~	($\mu g/L$)
Mercury (total)	~~71900~~	0.012

****

g) Single-value standards apply at the following concentrations for these substances: ~~Concentrations of the following chemical constituents shall not be exceeded except in waters for which mixing is allowed pursuant to Section 302.102.~~

Constituent	Unit	~~STORET Number~~	Standard
Barium (total)	mg/L	~~01007~~	5.0
~~Boron (total)~~	~~mg/L~~	~~01022~~	~~1.0~~
Chloride (total)	mg/L	~~00940~~	500
~~Fluoride~~	~~mg/L~~	~~00951~~	~~1.4~~
Iron (dissolved)	mg/L	~~01046~~	1.0
~~Manganese (total)~~	~~mg/L~~	~~01055~~	~~1.0~~

***

where: mg/L = milligrams per liter and
μg/L = micrograms per liter

h) Water quality standards for sulfate are as follows: ~~The following concentrations for sulfate must not be exceeded except in receiving waters for which mixing is allowed pursuant to Section 302.102:~~

***

***

As explained above, the Agency is proposing to amend the language in Subsection 302.208(a), (b) and (c) to include the language from existing subsection 302.208(d) that addresses how each type of standard is applied. Subsection (d) is replaced with language from subsections (g) and (h) describing how the single-value standards are applied. This change is intended to assist the reader in understanding how each type of standard (acute, chronic, human health and single-value) will be applied.

Also in Section 302.208, the Agency is proposing to delete references to STORET numbers and to change the term "metal" to "chemical constituent" in subsection (b) for accuracy and for consistency with the other subsections. The Agency is proposing to add an "s" to milligram and microgram in the equation keys in subsections (e) and (g) and adding "of" between base and natural in the key in subsection (e). In subsection (e) the phrase "(Weak acid

dissociable or available)" to the table after cyanide and "(total)" is added to mercury in subsection (f).

The Agency's proposal in Section 302.208 also corrects the error to the derivation of the chronic zinc water quality standard that was explained above. This correction of the error in the existing formula for the General Use chronic water quality standard for zinc results in a change in the equation in the Table in Section 302.208(e) from A = -0.8165 to A = -0.4456.

Finally, the outdated boron, fluoride and manganese standards are deleted from subsection (g) and the new proposed standards are added to subsection (e).

SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS

The following amendments (in addition to the deletion of all STORET numbers in the Table) are proposed for 35 Ill. Adm. Code Part 302, Subpart C, Sections 302.303 and 302.304:

Section 302.303 Finished Water Standards

Water shall be of such quality that with treatment consisting of coagulation, sedimentation, filtration, storage and chlorination, or other equivalent treatment processes, the treated water shall meet in all respects the requirements of Part 611~~604~~.
(Note: Prior to codification, Table I, Rule 304 of Ch 6: Public Water Supplies.)

Section 302.304 Chemical Constituents

The following levels of chemical constituents shall not be exceeded:

CONSTITUENT	~~STORET NUMBER~~	CONCENTRATION (mg/l)
***		
Boron (total)		1.0
***		
Chloride (total)	~~00940~~	250~~.~~
***		1.4
Fluoride (total)		
***		
Manganese (total)	~~01055~~	1.0~~0.15~~

Nitrate-Nitrogen	~~00620~~	~~10.~~
***		
Sulfates	~~00945~~	~~250.~~
Total Dissolved Solids	~~70300~~	~~500.~~

In Section 303.303 the Agency is deleting a cross-reference to Part 604, which has been repealed, and replacing it with the appropriate cross-reference to the drinking water standards in Part 611. In Section 303.304, the Agency is proposing to delete all STORET numbers (even those not repeated above) and a handful of misplaced periods or decimal points. The term "(total)" is added after chloride in the table and the current General Use water quality standards for boron and fluoride are moved to this Section applicable at Public Water Supply intakes. The amended Public and Food Processing Water Supply standard for manganese of 1 mg/liter is also included.

SUBPART E: LAKE MICHIGAN BASIN WATER QUALITY STANDARDS

The proposed changes to Subpart E are being made to 35 Ill. Adm. Code 302.504, 302.553 and 302.595. In addition to the deletion of all STORET numbers from the Tables, in Section 302.504 the Agency proposal contains the following language:

Section 302.504 Chemical Constituents

The following concentrations of chemical constituents must not be exceeded, except as provided in Sections 302.102 and 302.530:

a) The following standards must be met in all waters of the Lake Michigan Basin. Acute aquatic life standards (AS) must not be exceeded at any time except for those waters for which the Agency has approved a zone of initial dilution (ZID) pursuant to Sections 302.102 and 302.530. Chronic aquatic life standards (CS) and human health standards (HHS) must not be exceeded outside of waters in which mixing is allowed pursuant to Section 302.102 and 302.530 by the arithmetic average of at least four consecutive samples collected over a period of at least four days. The samples used to demonstrate compliance with the CS or HHS must be collected in a manner which assures an average representation of the sampling period.

Constituent	~~STORET Number~~	Unit	AS	CS	HHS
***					
Boron (total)		mg/L	40.1	7.6	NA
***					
Cyanide (Weak acid dissociable or available)	~~00718~~	µg/L	22	5.2	NA
Fluoride (total)		µg/L	exp[A +Bln(H)] where A = 6.7319 and B = 0.5394	exp[A +Bln(H)], but shall not exceed 4.0 mg/L where A = 6.0445 and B = 0.5394	NA
***					
Manganese (dissolved)		µg/L	exp[A +Bln(H)] X 0.9812* where A = 4.9187 and B = 0.7467	exp[A +Bln(H)] X 0.9812* where A = 4.0635 and B = 0.7467	NA
***					
Toluene	~~78131~~	µg/L~~mg/L~~	2000	610	51.0
***					

Where:

NA = Not Applied
Exp[x] = base of natural logarithms raised to the x-power

ln(H) = natural logarithm of Hardness
~~(STORET 00900)~~
* = conversion factor multiplier for dissolved metals

b) The following water quality standards must not be exceeded at any time in any waters of the Lake Michigan Basin, unless a different standard is specified under subsection (c) of this Section.

Constituent	~~STORET Number~~	Unit	Water Quality Standard
***			
~~Boron (total)~~	~~01022~~	~~mg/L~~	~~1.0~~
***			
~~Fluoride~~	~~00951~~	~~mg/L~~	~~1.4~~
***			
~~Manganese (total)~~	~~01055~~	~~mg/L~~	~~1.0~~
***			

c) In addition to the standards specified in subsections (a) and (b) of this Section, the following standards must not be exceeded at any time in the Open Waters of Lake Michigan as defined in Section 302.501.

Constituent	~~STORET Number~~	Unit	Water Quality Standard
***			
Boron (total)		mg/L	1.0
***			
Chloride (total)	~~00940~~	mg/L	12.0
Fluoride (total)		mg/L	1.4
***			
Manganese (total)	~~01055~~	mg/L	0.15

***

d) In addition to the standards specified in subsections (a), (b) and (c) of this Section, the following human health standards (HHS) must not be exceeded in the Open Waters of Lake Michigan as defined in Section 302.501 by the arithmetic average of at least four consecutive samples collected over a period of at least four days. The samples used to demonstrate compliance with the HHS must be collected in a manner which assures an average representation of the sampling period.

Constituent	~~STORET Number~~	Unit	Water Quality Standard
***			
~~Toluene~~	~~78131~~	~~mg/L~~	~~5.60~~
***			

The Agency has proposed elimination of STORET numbers throughout this Section. Subsection (a) contains the new boron, fluoride and manganese water quality standards which are in line with those proposed for General Use waters. The phrase "or available" is added after "weak acid dissociable" following the cyanide standard in subsection (a). An error in the toluene units is corrected from milligrams to micrograms in subsection (a). The outdated boron, fluoride and manganese standards are deleted from subsections (b), while the same standards for boron and fluoride are added to the Open Waters of Lake Michigan language in subsection (c). The term "(total)" is added after "chloride" in subsection (c). Finally, the duplicative and unnecessary toluene standard is deleted from subsection (d). No changes are proposed to subsection (e).

The following amendments are proposed for Section 302.553(d) and 302.595(a):

Section 302.553 Determining the Lake Michigan Aquatic Toxicity Criteria or Values - General Procedures

The Lake Michigan Aquatic Life Criteria and Values are those concentrations or levels of a substance at which aquatic life is protected from adverse effects resulting from short or long term exposure in water.

****

d) If data for acute effects are not available for all the eight families listed above, but are available for the family Daphnidae, a Tier II value shall be derived according to procedures in Section 302.563. If data for chronic effects are not available for all the eight families, but there are acute and chronic data available according to Section 302.565(b) so that three acute to chronic ratios (ACRs) can

be calculated, then a Tier I chronic criterion can be derived according to procedures in Section 302.565. If three ACRs are not available, then a Tier II chronic value can be derived according to procedures in Section 302.565(be).

The cross-reference to Section 302.565(e) found in Section 302.553(d) is incorrect, because that subsection does not exist in the Board's rules. It is being replaced with the correct cross-reference to Section 302.565(b).

Section 302.595 Listing of Bioaccumulative Chemicals of Concern, Derived Criteria and Values

a) The Agency shall maintain a listing of toxicity criteria and values derived pursuant to this Subpart. This list shall be made available to the public and updated periodically but no less frequently than quarterly, and when updated shall be published on the Agency's website ~~when updated in the Illinois Register~~.

****

The amendment to this subsection is designed to replace the duplicative effort of making the list of derived water quality criteria available on both the Illinois EPA website and in the Illinois Register as discussed above.

SUBPART F: PROCEDURES FOR DETERMINING WATER QUALITY CRITERIA

In Subpart F of Part 302, the Agency is proposing changes to Sections 302.648, 302.657 and 302.669. The following changes are proposed to Section 302.648 and 302.657:

Section 302.648 Determining the Human Threshold Criterion

The HTC is calculated according to the equation:

***

W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public

access areas pursuant to Section 302.102~~302.201~~(b)(3), or 0.001 liters per day (L/d) for other General Use waters;

***

Section 302.657 Determining the Human Nonthreshold Criterion

The HNC is calculated according to the equation:

***

W = Per capita daily water consumption equal to 2 liters per day (L/d) for surface waters at the point of intake of a public or food processing water supply, or equal to 0.01 liters per day (L/d) which represents incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities for areas which are determined to be public access areas pursuant to Section 302.102~~302.201~~(b)(3), or 0.001 liters per day (L/d) for other General Use waters;

***

Both of these Sections contain a cross-reference to Section 302.201(b)(3). That referenced provision does not exist and is being amended to the reference the correct and existing Section 302.102(b)(3). This was likely simply a typographical error in the existing rules.

The following language is proposed for Section 302.669:

Section 302.669 Listing of Derived Criteria

a) The Agency shall develop and maintain a listing of toxicity criteria pursuant to this Subpart. This list shall be made available to the public and updated periodically but no less frequently than quarterly, and when updated shall be published on the Agency's website ~~when updated in the Illinois Register~~.

The Agency is proposing one final amendment to Part 302, which is to eliminate the requirement in Section 302.669 to publish derived criteria quarterly in the Illinois Register and to instead publish quarterly updates on the Illinois EPA website.

PART 303, SUBPART C: SPECIFIC USE DESIGNATIONS AND SITE SPECIFIC WATER QUALITY STANDARDS

The Agency is also proposing one change at this time to 35 Ill. Adm. Code Part 303. This change is a repeal of Section 303.312:

Section 303.312 Waters Receiving Fluorspar Mine Drainage (Repealed)

~~a) The fluoride standard of Section 302.208 shall not apply to waters which:~~

~~1) receive effluent from the mines and mills of the fluorspar mining and concentrating industry, and~~

~~2) have been designated by the Illinois State Water Survey as streams which once in ten years have an average minimum seven day low flow of zero.~~

~~b) Such waters shall meet the following standard with regard to fluoride:~~

~~CONSTITUENT~~	~~STORET NUMBER~~	~~CONCENTRATION mg/l~~
~~Fluoride~~	~~00950~~	~~5~~

This provision provided site-specific relief from the fluoride standard to two companies: Ozark-Mahoning and Minerva Oil who performed Fluorspar mining in Pope and Hardin Counties in southern Illinois. *See*, In the Matter of: Proposed Amendments to Rules 203 and 408 of the Illinois Water Pollution Control Regulations, R73-15 (March 6, 1975) (Attachment 4). The receiving streams impacted by discharges from these two companies are outlined in pages 3 and 4 of the Board's March 6, 1975 Opinion and Order. Both companies have ceased production and terminated their discharge permits. In fact, according to the Illinois State Geologic Survey there are currently no companies conducting fluorspar in Illinois or anywhere in the United States. *See*, Attachment 5. If fluorspar mining were to resume in Illinois, it is likely that such activity could comply with the new, less stringent, General Use fluoride water quality standards. If additional relief would be necessary, the Agency believes that the affected party should justify such future relief to the Board under the current science and the new, updated fluoride water quality standards.

IV. FACTS IN SUPPORT

The proposal before the Board relies on the technical support document prepared by Bureau of Water staff at the Illinois EPA and a variety of studies and papers cited in that report. The facts in support of this proposal are outlined in detail in Attachment 1. In particular, the Agency relied extensively on the results of tests conducted by Dr. Soucek of the Illinois Natural History Survey. Dr. Soucek's Report of the studies conducted is included this rulemaking submittal as Exhibit U to Attachment 1. The documents relied on and methods for obtaining underlying data are explained below and a comprehensive list of Exhibits and documents relied upon in developing this rulemaking proposal is provided at the end of this Statement of Reasons.

V. TECHNICAL FEASIBILITY AND ECONOMIC JUSTIFICATION

Section 27 of the Act requires the Board to consider the technical feasibility and economic reasonableness of all rulemaking proposals.

A. Technical Feasibility

Illinois EPA has investigated the treatment options for boron and fluoride as a result of the Agency's obligation to provide recommendations to the Board in response to petitions for site specific regulatory relief from these water quality standards. Both substances are highly soluble and this characteristic generally confounds attempts at treatment. Boron does not respond to the usual method of treating metals by raising pH and precipitating the metal to sludge. Fluoride likewise does not respond to this manner of treatment. The only methods of treatment identified have been reverse osmosis, which is seldom acceptable as it results in a high concentration wastewater that still must be disposed of, and various non-conventional treatment processes that are very expensive and have not seen routine use. In every case for site-specific water quality standards or adjusted standards brought before the Board, Illinois EPA has

concluded that no reasonable treatment exists for boron and fluoride to reduce effluent concentrations. *See*, Attachment 1, Exhibit D.

Unlike boron and fluoride, manganese does respond to treatment by raising pH and thereby forcing precipitation. A chemical is added to a basin which raises effluent pH causing manganese to precipitate. The proposed change in the manganese water quality standard may relieve future mine outfalls from manganese treatment, however, manganese permit limits may still be dictated by 35 Ill. Adm. Code Subtitle D: Mine Related Water Pollution. Other than some coal mines, the only facilities known to treat for manganese are public water supply treatment plants that remove manganese from surface water to meet drinking water standards and then must filter or settle suspended manganese particles from the wastewater. The Agency does believe this rulemaking will result in the need to implement additional treatment technologies beyond those required by the existing regulations.

B. Economic Justification

In addition to technical feasibility, the Board is required to examine the economic impacts of any new technology required by this rulemaking proposal. The Agency does not expect that any of these water quality standards changes will require any new technology upgrades to achieve compliance. Although the proposal makes a number of changes to the boron, fluoride, and manganese standards applicable to the Lake Michigan Basin, Public and Food Processing and General Use water quality standards, these standards should not become more stringent than the existing standards in any waters of the State of Illinois. The only water quality standard that could become more stringent than the existing standard is in General Use waters where the ambient hardness is less than 45 milligrams per liter which would result in a chronic manganese standard of less than 1 milligram per liter. The Agency is not aware of any

facilities that will be required to install upgrades to achieve compliance with this proposal. The only foreseeable exception to this will be if any of the facilities currently granted regulatory relief that is not moot as a result of this standard are unable to demonstrate that they can either meet the new standard or are no longer able to meet the standards for the grant of regulatory relief by the Board. As explained below, this is expected to be a small group of sources and the Agency hopes these sources will come forward and address their concerns as part of the rulemaking proceeding. For these reasons, the Agency's proposed changes are clearly technically feasible and economically reasonable.

VI. AFFECTED FACILITIES AND OUTREACH

A. Affected Facilities

This rulemaking proposal would establish revised ambient water quality standards and does not seek to establish any specific effluent standards or other requirements targeted at specific facilities or classes of facilities. However, if a discharger in the State of Illinois has permit limits driven by water quality standards rather than or in addition to technology based limits, they could potentially be affected by one or more of the various standards being proposed.

In the case of dischargers who are currently in compliance with the existing water quality standards for boron, fluoride and manganese, there should be no impact. Illinois EPA expects that for those facilities, the applicable water quality standard is either staying the same or becoming less stringent, so there will be no impact. The only classes of facilities the Agency considers to be potentially impacted negatively by this proposal are those facilities with existing regulatory relief from the current standard or facilities that discharge to receiving waters with less than 45 mg/L hardness and have a reasonable potential to discharge greater than 1.0 milligrams per liter of manganese as a long term average. As further detailed on page 19 of

Attachment 1, critical hardness concentrations in Illinois waters are rarely less than 90 milligrams per liter and no ambient water quality monitoring network stations are known to possess a critical hardness of less than 45 milligrams per liter. *See also*, Attachment 1, Exhibit S.

A complete list of potentially affected facilities with existing regulatory relief from the current water quality standards is provided as Exhibit D to Attachment 1. This list of affected facilities and stream segments includes four facilities with fluoride relief and eight facilities with boron relief. There is also currently a site-specific rule that sets a water quality standard of 5 mg/L in waters receiving discharges from fluorspar mining activities in 303.312. That relief was originally adopted to impact two companies - Ozark-Mahoning and Minerva Oil. *See*, R73-15 (March 6, 1975). Since there is no longer any fluorspar mining in the United States and since this relief was granted thirty-five years ago, the Agency is proposing to repeal that provision at this time.

In the Board Opinion in *In the Matter of: City of Galva Site Specific Water Quality Standard for Boron Discharges to Edwards River and Mud Run Creek: 35 Ill. Adm. Code 303.447 and 303.448* the Board found:

> The Board notes that the record indicates the Agency is cooperating with the Illinois Natural History Survey (INHS) to generate additional boron toxicity studies to supplement the current database. Such data would help to ensure that boron general use standards proposed in the future would be protective of aquatic life. The results of the Agency/INHS study is expected to bolster the scientific justification for the revision of the general use boron water quality standard. If the Agency/INHS study results in new boron toxicity information that raises any concerns with the site specific standards or renders such standards as moot, the Board expects the Agency to address those concerns as part of its proposal to revise the general use standards. The Board notes that in the past, the Board has revised existing site specific rules to make them consistent with the adopted revisions to the rule of general applicability. See Proposed New and Updated Rules for Measurement and Numerical Sound Emissions Standards Amendments to 35 Ill. Adm. Code 901 and 910, (R03-9) March 2, 2006.

See, R09-11 (August 6, 2009). *See also, In the Matter of: Proposed Site Specific Rule for City of Springfield, Illinois, Office of Public Utilities, City, Water, Light and Power and Springfield Metro Sanitary District from 35 Ill. Adm. Code 302.208(g): New 35 Ill. Adm. Code 303.446*, R09-8 (May 21, 2009).

Of the facilities with fluoride regulatory relief granted by the Board, there are none that have relief that would exceed the proposed acute standard. However, the Agency also had to consider whether any of the affected facilities would exceed the proposed chronic standard.

The relief granted to Granite City Steel in *In the Matter of: Granite City Division of National Steel Petition for Adjusted Standard from 35 Ill. Adm. Code 302.208: Numeric Standard for Fluoride*, AS 90-4 (April 8, 1993) should become moot because the chronic fluoride standard will be the same as the never to be exceeded standard granted in Horseshoe Lake. Based information contained in Discharge Monitoring Reports, it appears that the fluoride relief granted to Modine Manufacturing in *In the Matter of: Site-Specific Limitation for the Modine Manufacturing Company Facility, Ringwood, Illinois*, R87-36 (May 24, 1990) and to the City of Effingham in *In the Matter of Site Specific Rule for City of Effingham Treatment Plant Fluoride Discharge, 35 Ill. Adm. Code 304.233*, R03-11 (December 18, 2003) should no longer be necessary.[1] For Modine Manufacturing, the company's Discharge Monitoring Reports show that the facility no longer has elevated fluoride levels in its discharge, so the relief granted by the Board in R87-36 may no longer be necessary. For the City of Effingham, the Discharge Monitoring Reports show that the highest fluoride value reported since July of 2005 is 4.0 mg/L.

[1] The fluoride relief granted to the City of Effingham required compliance with a 2.0 mg/L water quality standard at the City of Flora's public water supply intake. That relief, as written, would have caused the Agency's proposed Public and Food Processing Water Supply standard to be exceeded. However, since the Board opinion was issued in R03-11, the City of Flora has connected to the Gateway Regional Water Supply System and no longer has a surface water intake in the Little Wabash River so compliance with the proposed new Public and Food Processing Water Supply fluoride water quality standard of 1.4 mg/L will not be a problem.

Based on this information, it appears that Effingham would not need regulatory relief in order to comply with the proposed chronic fluoride standard of 4.0 mg/L as a monthly average.

General Motors is the only facility granted regulatory relief by the Board from the fluoride water quality standard that the Agency has identified will still need the Board relief upon adoption of the Agency's fluoride proposal. *See, In the Matter of: Petition of General Motors Corporation to Amend 35 Ill. Adm. Code 303.222* (Site Specific Regulation for Fluoride), R93-13 (January 11, 1995) and Attachment 1, Exhibit D.

For the site-specific regulatory relief from the boron water quality standards, none of the dischargers would cause an exceedance of the proposed acute boron standard of 40.1 mg/L. As with fluoride, the Agency investigated whether the chronic standard of 7.6 mg/L would be met in all cases.

The following three facilities have relief from the boron standard that will clearly become moot upon adoption of the Agency's proposal: City of Galva (Northeast STP)(*In the Matter of: City of Galva Site Specific Water Quality Standard for Boron Discharges to Edwards River and Mud Run Creek: 35 Ill. Adm. Code 303.447 and 303.448*, R09-11 (August 6, 2009)), Akzo Nobel (*In the Matter of: Petition of Akzo Chemicals, Inc. for an Adjusted Standard from 35 Ill. Adm. Code 304.105 and 302.208*, AS93-8 (September 1, 1994)) and CILCO (Duck Creek)(*In the Matter of: Petition of Central Illinois Light Company (Duck Creek Station) for Adjusted Standard from 35 Ill. Adm. Code 302.208 and 35 Ill. Adm. Code 304.105 Regarding the Parameter Boron*, AS96-8 (June 20, 1996)). These standards will become moot because the never-to-be-exceeded relief granted by the Board in these proceedings is lower than the new chronic standards proposed by the Agency.

Review of the relief granted and the Discharge Monitoring Reports and discussions with interested parties has led the Agency to conclude that the chronic standard will be consistently met and therefore the boron relief granted by the Board should no longer be needed for four of the remaining five facilities. These facilities are City of Springfield, Spring Creek STP; Dynegy Baldwin Station (Illinois Power); Southern Illinois Power Cooperative (SIPC); and Dynegy Midwest Generation – Wood River Station (Illinois Power). *See, In the Matter of: Proposed Site Specific Rule for City of Springfield, Illinois, Office of Public Utilities, City, Water, Light and Power and Springfield Metro Sanitary District from 35 Ill. Adm. Code 302.208(g): New 35 Ill. Adm. Code 303.446*, R09-8 (May 21, 2009); *In the Matter of: Petition of Illinois Power Company (Baldwin Power Plant) for Adjusted Standard from 35 Ill. Adm. Code 302.208 and 35 Ill. Adm. Code 304.105 Regarding the Parameter Boron*, AS96-1 (Mary 2, 1996); *In the Matter of: Petition of South Illinois Power Cooperative (Marion Power) for Adjusted Standard from 35 Ill. Adm. Code 302.208(e),* AS92-10 (July 1, 1993); and *In the Matter of: The Proposed Amendment to Rule 203 of the Water Pollution Regulations* (R76-18)(May 25, 1978). While there was initially a potential that relief granted to these facilities could have resulted in exceedance of the chronic boron water quality standard in one of the impacted stream segments, further investigation revealed that Board relief from the new chronic standard would no longer be necessary for these facilities.

Based on the Agency's initial investigations, it appears that the boron relief granted by the Board will still be necessary for at least one of the identified segments for one of the affected facilities. This facility is Springfield City Water Light and Power and the impacted segment is Sugar Creek from Spaulding Dam to Sewage Treatment Plant only. See, *In the Matter of:*

Petition of the City of Springfield, Office of Public Utilities for an Adjusted Standard from 35 Ill. Adm. Code 302.208(e), AS94-9 (December 1, 1994).

In addition, there are several classes of facilities that have the potential to benefit from this proposal. Dischargers to streams with Public and Food Processing Water Supply intakes may benefit from removal of some streams from the 303(d) List for manganese. It is also possible that coal mines and other industrial or municipal dischargers with water quality based effluent limits may benefit from the new General Use standards for boron, fluoride and manganese. With regard to the proposed correction to the zinc water quality standard, it is possible that correction of this error will benefit some facilities that are currently having difficulty meeting their permit limits. The Agency has identified all facilities in the State with permit limits for zinc and has included that list of potentially impacted facilities at Attachment 7 to this Statement of Reasons.

B. Outreach

Illinois EPA shared a draft rulemaking proposal with approximately 120 stakeholders on September 17, 2009. These stakeholders included representatives of state and federal government agencies, universities, environmental groups, industrial dischargers, municipal dischargers, trade associations and consulting engineers.

A meeting was held on October 19, 2009 at the Illinois EPA Headquarters in Springfield to explain the draft proposal and respond to any questions or comments. Approximately 25 stakeholder representatives attended. The Agency made presentations on the different components of the draft proposal and answered questions on the presentations. The Agency also distributed copies of the various presentations following the meeting. The Agenda and Sign In

list from the stakeholder meeting are included as Attachments 2 and 3 to this Statement of Reasons.

The Agency accepted written comments from the stakeholders following the meeting. Comments were received from the Springfield Metropolitan Sanitary District and the Illinois Environmental Regulatory Group.

Follow-up emails were sent to the stakeholders on July 8, 2010 and November 10, 2010. These emails updated the stakeholders on changes to the proposal as a result of additional tests and information becoming available and the Agency's progress and timeline towards filing this proposal with the Board.

VII. SYNOPSIS OF TESTIMONY

Pre-filed Testimony will be submitted by two Illinois EPA witnesses, Bob Mosher and Brian Koch.

A. Bob Mosher, Manager, Water Quality Standards Unit, Division of Water Pollution Control, Bureau of Water, Illinois EPA

Mr. Mosher will present testimony on the background and history of the current General Use, Lake Michigan Basin and Public and Food Processing Water Supply water quality standards for boron, fluoride and manganese. He will also present testimony on the proposed change to the derived water quality criteria publication provision and the additional non-substantive updates to the regulatory language in Part 302. Mr. Mosher will also be available to answer general questions on the water quality standards program and the triennial review process.

B. Brian Koch, Environmental Protection Specialist, Water Quality Standards Unit, Division of Water Pollution Control, Bureau of Water, Illinois EPA

Mr. Koch will present technical testimony regarding the development of the proposed changes to the boron, fluoride and manganese General Use, Lake Michigan Basin and Public and Food Processing Water Supply water quality standards. He will testify about the literature surveyed and new toxicity tests performed in support of this water quality standard proposal to the Board. He will be available to answer technical questions regarding the toxicity of boron, fluoride and manganese to aquatic life and the water quality standard derivation process for these parameters. Mr. Koch will also explain and answer questions related to the error discovered by the Agency in the derivation of the zinc water quality standard and the correction of that error in this proceeding.

C. Testimony in Support of the Agency's proposal

At this time, Mr. Mosher and Mr. Koch are the only anticipated witnesses in support of this rulemaking proposal that Illinois EPA intends to call to provide testimony. Both witnesses are expected to submit Pre-filed Testimony to the Board as directed by the Hearing Officer. The Agency also reserves the right to submit testimony from additional witnesses if necessary to address any questions or concerns raised by the public or the Board with respect to this proposal and to have additional Agency staff present at the Board hearings on this proposal to answer unforeseen questions that may arise.

VIII. SUPPORTING DOCUMENTATION

A. Statement Regarding Compliance with 5 ILCS 100/5-40(3.5)

Pursuant to the Illinois Administrative Procedure Act, the Board's procedural rules provide that rulemaking proponents must submit to the Board "*A descriptive title or other description of any published study or research report used in developing the rule, the identity of the person who performed such study, and a description of where the public may obtain a copy*

of any such study or research report. If the study was performed by an agency or by a person or entity that contracted with the agency for the performance of the study, the agency shall also make copies of the underlying data available to members of the public upon request if the data are not protected from disclosure under the Freedom of Information Act [5ILCS 140]. [5 ILCS 100/5-40(3.5)]." 35 Ill. Adm. Code 102.202(e).

To assist the Board in compliance with these requirements, the Agency has attempted to file as Attachments to this proposal the bulk of the information relied on in developing this proposal to the Board. See Section B below for the List of Attachments that provides the relevant identifying information for these Attachments. In addition, the Agency has provided a second list in Section C below of documents relied upon, but not submitted to the Board as Attachments to this rulemaking proposal. Many of these documents are U.S. EPA guidance documents and Board opinions that are readily accessible by the Board and the public.

With regard to studies conducted by the Agency or by an entity that contracted with the Agency for performance of the study, the Agency has provided summaries of the underlying data from those studies as Attachments to the Statement of Reasons and Technical Support Document. To the extent that the Agency relied on studies with voluminous amounts of raw data or documents that are subject to copyright protection, the Agency will make such underlying data and supporting documents available to members of the public at the Illinois EPA Library which is located at the Agency Headquarters at the following address:

Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

The studies relied on in developing these proposals which are summarized, but not attached are identified both in the list of references in Attachment 1 and in Subsection C below.

B. List of Attachments

Attachment 1 – Facts in Support of Changing Water Quality Standards for Boron, Fluoride, and Manganese (Illinois EPA, Bureau of Water, 2010)

Exhibit A – Water Quality Criteria (Boron), McKee and Wolf (1963)
Exhibit B – Water Quality Criteria (Fluoride) McKee and Wolf (1963)
Exhibit C – Water Quality Criteria (Manganese) McKee and Wolf (1963)
Exhibit D – Site-specific relief granted by the IPCB for boron and fluoride to date
Exhibit E – Manganese removal estimations at conventional utilities located on impaired Public and Food Processing water Supply waters with Mn exceeding 150 ug/L
Exhibit F – Guidelines for deriving numerical National Water Quality Criteria for the protection of aquatic organisms and their uses
Exhibit G – Acute Toxicity Data used in Boron Standard Derivation
Exhibit H – Chronic Toxicity in Boron Standard Derivation
Exhibit I – Boron Standard Derivation using 1985 Guidelines Methodology
Exhibit J – Influence of hardness and pH on boron toxicity
Exhibit K – Fluoride Standard Derivation Using 1985 Guidelines Methodology
Exhibit L – Manganese Standard Derivation Using 1985 Guidelines Methodology
Exhibit M – Acute and chronic fluoride standards at variable hardness using 1985 Guidelines Methodology
Exhibit N – Acute and chronic manganese standards at variable hardness using 1985 Guidelines Methodology
Exhibit O – Acute toxicity data used in fluoride Standard Derivation
Exhibit P – Chronic toxicity data used in fluoride Standard Derivation
Exhibit Q – Acute toxicity used in manganese Standards Derivation
Exhibit R – Chronic toxicity data used in manganese Standard Derivation
Exhibit S – Ambient Water Quality Monitoring Network (AWQMN)
Exhibit T – Calculation of the conversion factor multiplier for manganese standards derived from total and dissolved manganese data collected during the chronic *Hyalella azteca* test. For each treatment, the filtered (dissolved) results were divided by the unfiltered (total) results to calculate the percent of dissolved manganese
Exhibit U – Final Report, Acute and Chronic Toxicity of Boron, Fluoride, and Manganese to Freshwater Organisms, by David J. Soucek and Amy Dickinson, Illinois Natural History Survey, University of Illinois, October 14, 2010
Exhibit V – Excerpts from Exhibit S to Agency Rulemaking Proposal in R02-11
Exhibit W – Accumulation, regulation and toxicity of copper, zinc, lead and mercury in *Hyalella azteca*, U. Borgmann, W.P. Norwood & C. Clarke, *Hydrobiologia*, 259: 79 – 89 (1993)
Exhibit X: Revised chronic zinc standard using the corrected *Hyalella azteca* MATC

Attachment 2 – Water Quality Standards Stakeholders Meeting Agenda, dated October 19, 2009

Attachment 3 – Water Quality Standards Stakeholders Meeting Sign in list, dated October 19, 2009

Attachment 4 – Opinion and Order of the Illinois Pollution Control Board, In the Matter of: Proposed Amendments to Rules 203 and 408 of the Illinois Water Pollution Control Regulations, R73-15 (March 6, 1975)

Attachment 5 – Information from the Illinois State Geological Survey

Attachment 6 – Great Lakes Environmental Commission Final Report (October 22, 2010) (excerpts pertaining to boron, manganese and fluoride tests only)

Attachment 7 – Facilities with NPDES Permit Limits Based on the Incorrect Chronic Standard for Zinc

Attachment 8 – Agency Errata Sheets 1, 2 and 3 from R02-11

C. List of Documents Relied Upon But Not Attached

Guidance Documents

Method OIA-1677 Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, 821-R-99-013, United States Environmental Protection Agency (August, 1999).

Standard Methods for the Examination of Water and Wastewater: Centennial Edition. 21st Edition. Eaton, AD, LS Clesceri, EW Rice, AE Greenberg, and MAH Franson (editors). ISBN: 0875530478. American Public Health Association. 2005. Washington, D.C.

Pollution Control Board Opinions: Rulemakings of General Applicability

In the Matter of: Water Quality Triennial Review: Amendments to 35 Adm. Code 302.105, 302.208(e)-(g), 302.504(a), 302.575(d), 309.141(h); and Proposed 35 Ill. Adm. Code 301.267, 301.313, 301.413, 304.120, and 309.157, R02-11 (December 19, 2002).

In the Matter of: Conforming Amendments for the Great Lakes Initiative: 35 Ill. Adm. Code Part 302.101; 302.105; 302.Subpart E; 303.443, and 304.222, R97-25 (

In the Matter of: Proposed Amendments to Title 35, Subtitle C (Toxins Control), R88-21 – Docket A (January 25, 1990).

In the Matter of: Water Quality Standards Revisions, R71-14 (Consolidated with R70-8 and R71-20) (March 7, 1972).

Pollution Control Board Opinions: Site Specific Rulemakings and Adjusted Standards

Boron

In the Matter of: City of Galva Site Specific Water Quality Standard for Boron Discharges to Edwards River and Mud Run Creek: 35 Ill. Adm. Code 303.447 and 303.448, R09-11 (August 6, 2009).

In the Matter of: Proposed Site Specific Rule for City of Springfield, Illinois, Office of Public Utilities, City, Water, Light and Power and Springfield Metro Sanitary District from 35 Ill. Adm. Code 302.208(g): New 35 Ill. Adm. Code 303.446, R09-8 (May 21, 2009).

In the Matter of: Petition of Central Illinois Light Company (Duck Creek Station) for Adjusted Standard from 35 Ill. Adm. Code 302.208 and 35 Ill. Adm. Code 304.105 Regarding the Parameter Boron, AS96-8 (June 20, 1996).

In the Matter of: Petition of Illinois Power Company (Baldwin Power Plant) for Adjusted Standard from 35 Ill. Adm. Code 302.208 and 35 Ill. Adm. Code 304.105 Regarding the Parameter Boron, AS96-1 (May 2, 1996)).

In the Matter of: Petition of the City of Springfield, Office of Public Utilities for an Adjusted Standard from 35 Ill. Adm. Code 302.208(e), AS94-9 (December 1, 1994).

In the Matter of: Petition of Akzo Chemicals, Inc. for an Adjusted Standard from 35 Ill. Adm. Code 304.105 and 302.208, AS93-8 (September 1, 1994).

In the Matter of: Petition of South Illinois Power Cooperative (Marion Power) for Adjusted Standard from 35 Ill. Adm. Code 302.208(e), AS92-10 (July 1, 1993).

In the Matter of: The Proposed Amendment to Rule 203 of the Water Pollution Regulations, R76-18 (May 25, 1978)(Illinois Power Wood River Station).

Fluoride

In the Matter of: Granite City Division of National Steel Petition for Adjusted Standard from 35 Ill. Adm. Code 302.208: Numeric Standard for Fluoride, AS 90-4 (April 8, 1993).

In the Matter of: Petition of General Motors Corporation to Amend 35 Ill. Adm. Code 303.222 (Site Specific Regulation for Fluoride), R93-13 (January 11, 1995).

In the Matter of: Site-Specific Limitation for the Modine Manufacturing Company Facility, Ringwood, Illinois, R87-36 (May 24, 1990)

In the Matter of Site Specific Rule for City of Effingham Treatment Plant Fluoride Discharge, 35 Ill. Adm. Code 304.233, R03-11 (December 18, 2003).

Toxicity Studies and Data used in Derivation of Proposed Water Quality standards and summarized in Attachment 1, Exhibits G, H, O, P, Q and R:

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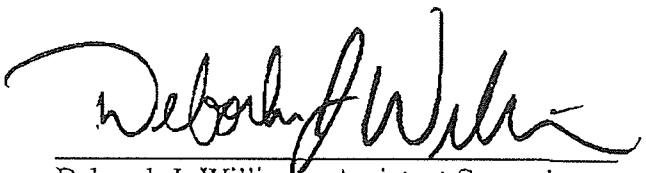
Respectfully Submitted,



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