

ILLINOIS POLLUTION CONTROL BOARD  
December 19, 1996

IN THE MATTER OF: )  
)  
TRIENNIAL WATER QUALITY REVIEW ) R94-1(B)  
AMENDMENTS TO 35 ILL. ADM. CODE ) (Rulemaking - Water)  
302.202, 302.212, 302.213, 304.122, and )  
304.301 (Ammonia Nitrogen) )

Adopted Rule.                      Final Order.

OPINION AND ORDER OF THE BOARD (by R.C. Flemal and C.A. Manning):

This matter comes before the Board on a regulatory proposal filed on February 24, 1994 by the Illinois Environmental Protection Agency (Agency). In a prior action the Board promulgated portions of that proposal. Today the Board takes final action on the remaining provisions of the Agency's proposal, those relating to ammonia.

The Board's responsibility in this matter arises from the Environmental Protection Act (Act) (415 ILCS 5/1 *et seq.* (1994)). The Board is charged therein to "determine, define, and implement the environmental control standards applicable in the state of Illinois". (415 ILCS 5/5(b) (1994).) More generally, the Board's rulemaking charge is based on the system of checks and balances integral to the Illinois environmental governance: the Board bears responsibility for the rulemaking and principal adjudicatory functions, while the Agency bears primary responsibility for the administration of the Act and Board regulations. The latter includes administering today's amendments.

The Agency filed the instant proposal as part of its required review of the applicable water quality standards of Illinois pursuant to the Federal Water Pollution Control Act, commonly known as the Clean Water Act (CWA) (33 U.S.C. § 1251 *et seq.* (1993)). Under section 101-607 of the CWA, the Agency is required to periodically, but at least every three years, review the water quality standards applicable in the State. This review, which is commonly known as the "triennial review", lends its name to the instant proceeding.

PROCEDURAL HISTORY

The Board originally opened Docket R94-1 to consider amendments to the Board's lead, mercury, and ammonia water quality regulations, as proposed by the Agency. Hearings to consider the full proposal were held before Board Hearing Officer Diane O'Neill on November 10, 1994 in Chicago, Illinois, and on November 22, 1994 in Springfield, Illinois;

testimony was received from the Agency, as well as from other interested persons<sup>1</sup>. Content of the testimony is detailed in the Board's first notice opinion<sup>2</sup>.

On December 8, 1994 an alternative proposal was filed under the sponsorship of a number of potentially affected dischargers<sup>3</sup>. The alternative proposal focused exclusively on concerns associated with the ammonia provisions of the then current proposal. An additional hearing was held on January 26, 1995 in Chicago, Illinois.

Following a period of public comment<sup>4</sup> and a pre-hearing conference held on November 8, 1995, the Board by order of January 4, 1996 severed the docket. The Board determined that the record supported moving forward with those portions of the initial proposal that dealt with lead and mercury (Sections 302.208 and 302.407). These items were placed in docket R94-1(A). The lead and mercury provisions subsequently proceeded through first and second notice, and were adopted by Board order of May 16, 1996.

In contrast, the Board determined that the ammonia provisions required additional development. Docket R94-1(B) was accordingly opened in the January 4, 1996 order to allow continued review of the ammonia provisions (Sections 302.202, 302.212, 302.213, 304.122, and 304.301) of the Agency's proposal.

Public hearings for Docket R94-1(B) were held before Board Hearing Officer Diane O'Neill on February 22 and 23, 1996 in Chicago, Illinois. The Board again received testimony from the Agency, as well as from other interested persons.

On April 8, 1996 the Agency filed, as part of PC 8(B), an amended ammonia proposal. On July 18, 1996 the Board adopted the amended proposal for first notice. First notice publication of the amendments to Part 302 occurred in the *Illinois Register* on August 9, 1996 at 20 Ill. Reg. 10539. The proposed amendments to Part 304 were published on August 16, 1996 at 20 Ill. Reg. 10760.

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<sup>1</sup> For purposes of citation herein, hearing transcripts are cited according to hearing number and page (e.g., Tr1. at \_\_\_), prefiled testimony is cited according to author and page (e.g., Mosher at \_\_\_) or to Exhibit number (Exh.), public comments are cited by the abbreviation "PC"..

<sup>2</sup> Anyone interested in reviewing the full procedural history of this case may consult the first notice opinion. See In the Matter of: TRIENNIAL WATER QUALITY REVIEW: AMENDMENTS TO 35 ILL. ADM. CODE 302.202, 302.212, 302.213, 304.122, AND 304.301, First Notice Opinion and Order, July 18, 1996.

<sup>3</sup> The proponents consisted of the Cities of Batavia, Geneva, Moline, St. Charles, Sterling, and Rock Falls, identified in the early stages of the record as "the Cities". In later filings, with changed membership, the proponents became identified as "the Ammonia Group".

<sup>4</sup> The interested person is directed to the Board's first notice opinion for a summary of all of the public comments.

On November 21, 1996 the Board adopted the ammonia provisions for second notice. On December 17, 1996 the Joint Committee on Administrative Rules (JCAR) voted “no objection” to the Board taking final action on this matter.

### OVERVIEW OF TODAY’S AMENDMENTS

Today’s amendments have two major provisions. The first deals with the General Use Water Quality Standards for un-ionized ammonia. The second deals with managing discharges of ammonia to certain waterways.

#### Ammonia: General Use Water Quality Standards

The Board’s water quality standards are found at 35 Ill. Adm. Code 302. At interest today are the Board’s General Use Water Quality Standards for ammonia, found at 35 Ill. Adm. Code 302.212.

One of the General Use Water Quality Standards for ammonia is a total ammonia nitrogen standard of 15 mg/L. That standard is not changed today.

The current standards also include an un-ionized ammonia of 0.04 mg/L, applicable at times when total ammonia nitrogen concentrations are between 1.5 mg/L and 15 mg/L. This standard is today replaced by four separate un-ionized ammonia standards: acute and chronic un-ionized ammonia standards applicable in the summer months, and acute and chronic un-ionized ammonia standards applicable in the winter months. The four values are:

Acute Standard (AS) - Summer	0.33 mg/L
Chronic Standard (CS) - Summer	0.057 mg/L
Acute Standard (AS) - Winter	0.14 mg/L
Chronic Standard (CS) - Winter	0.025 mg/L

Revised tables showing the allowable total ammonia nitrogen concentrations at each of the four un-ionized ammonia standards are also included in today’s amendments.

#### Effluent Modified Waters (Ammonia)

Today's new Sections 302.213 and 304.122(c) and (d) define and give the Agency authority to implement a new concept in water quality management, Effluent Modified Waters (EMW). EMWs are waters downstream from an effluent outfall and outside of any allowable mixing zone, wherein discharges to the EMW are driven by general effluent standards rather than by back-calculation from the water quality standards. EMWs are to be identified by the Agency.

For an EMW designation to apply, there must be a showing that total ammonia discharge concentrations are 1.5 mg/L or less in summer and 4.0 mg/L or less in winter, that the existing level of treatment will be maintained, and that new or increased ammonia loadings

to the stream would meet nondegradation standards in the stream. Further, acute ammonia standards must be met, and there can be no known uses of the stream that would be adversely affected by the discharge.

Today's action also includes repeal of Section 302.301, which provided for an exception to compliance with water quality standards for certain discharges during the winter months. This section expired by its own terms on July 1, 1991. The EMW provisions are intended to replace in part Section 302.301.

### DISCUSSION

It is the Board's responsibility whenever it engages in rulemaking to assure that the rule, as adopted, protects the environment, as well as conserves the public and private resources needed to maintain that protection. It is often a daunting responsibility. Nevertheless, we believe rules that are simultaneously environmentally responsive and economically responsible can be achieved. We further believe that today's action represents such a balance.

Our experience also reflects that we are most likely to achieve well-balanced rules when we have the active participation of the various interested and affected persons during the rulemaking process. That has certainly occurred here. The Board has benefited from the active participation of the Illinois Association of Wastewater Agencies (IAWA), the association that represents all municipal dischargers in Illinois; the United States Environmental Protection Agency (USEPA); environmental groups including the Sierra Club and Trout Unlimited; and a number of communities (exemplified by the Ammonia Group) and other dischargers. Today's amendments have evolved over the tenure of this rulemaking proceeding in reaction to the perspectives of the participants. It reached maturity, we believe, in April 1996 when the Agency filed its amended proposal (PC 8(B)). That proposal not only provided resolution of some of the contentious issues that had been raised during the hearing process, but also reflected consideration of environmental responsiveness and economic responsibility that is necessary for the Board to adopt the proposal.

In the remaining portions of this opinion we set forth the rationale for today's action. Additionally, because today's adopted rules do not include all the provisions advocated by all participants, we also explain why those provisions were not included. Moreover, we note that most of the discussion that follows focuses on the ammonia standards (Section 302.212). We emphasize that it is these standards and their environmental consequences, and the consequences related to National Pollutant Discharge Elimination System (NPDES) permits, that have been the focal point of this proceeding and consequently are the focal point of our discussion here.

## Environmental Impact

The Board's action today is based on the need to protect the State's lakes and streams from an elevated concentration of ammonia. Ammonia at elevated concentrations is toxic to aquatic organisms. Healthy aquatic communities are an integral part of a healthy environment. Accordingly, maintenance of a healthy environment requires placing a ceiling (i.e., a standard) on the amount of ammonia in our lakes and streams. The value of the ceiling (i.e., the value of standard) should be set at a level that prevents toxicity to the aquatic organisms.

We are fortunate that ammonia's effects on aquatic organisms constitute one of the better-studied aspects of environmental toxicology. We therefore know the concentrations at which ammonia becomes toxic to a large number of aquatic organisms, including a variety of fishes, shellfish, insects, and other invertebrates indigenous to Illinois waters. This information is summarized in the USEPA's "Ambient Water Quality Criteria for Ammonia - 1984", also known as the National Criteria Document (NCD) for ammonia. This document is present in the record as Exhibit E of the Agency's original proposal.

We are also fortunate that there is a straightforward procedure used to convert raw toxicological data, such as that contained in the NCD, into meaningful water quality standards. This procedure essentially consists of identifying the aquatic species that are present and that need protection, noting the record of toxicology information for the species and contaminant at issue, and by using a set of protocols, deriving the ceiling value(s) that ensure the survival of the species at issue. The protocols are well-developed and accepted. They can be found in the USEPA's "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses". This document is present in the record as Exhibit D of the Agency's original proposal. The protocols are also contained in the Board's own regulations at 35 Ill. Adm. Code 302.Subpart F.

The Agency has carried out the exercise of calculating standards necessary to protect aquatic life indigenous to Illinois. They have used the most recent data, including some data more recent than that provided in the NCD. On this basis, the Agency proposed water quality standards that are necessary to assure protection of aquatic life in the General Use waters of this State. We also note that the NCD provides a "default" set of standards, premised on the presence of ammonia-sensitive species that do not exist in Illinois General Use waters. By recalculating the standards using only indigenous species, the Agency was able to propose standards less stringent than would follow from simply accepting the "default" standards.

Moreover, we believe that a large number of participants in this proceeding agree with us fully, or in major part, concerning the need for the water quality standards in today's amendments. We do note, however, that not all participants held this viewpoint. There is a perspective that the standards are not stringent enough, while another perspective is that the standards are too stringent.

The view that the standards are insufficiently stringent stems, in part, from the observation that there are some waters in Illinois where unusually ammonia-sensitive fishes,

particularly salmonid fishes, including trout, are present. We agree that such waters do exist, although they are quite limited. It is because they are limited in extent that we do not today support incorporating salmonid fishes into any derivation of ammonia standards for Illinois General Use waters. We believe that the General Use Water Quality Standards should have general applicability and are accordingly an inappropriate vehicle to address support of very special and geographically-restricted areas. The Board observes that it has long utilized special standards for special needs<sup>5</sup> and that it will always entertain proposals to utilize this concept to give necessary protection to any Illinois waters that have special needs, including needs based on the presence of trout or other organisms.

The opposing viewpoint that the standards are too stringent stems largely from the observation that many streams seem to be healthy now<sup>6</sup>, with the status quo ammonia standards. In fact, the Agency itself observes that only short reaches of streams in Illinois today warrant classification as "ammonia impaired".

The Board fully agrees that Illinois waters are on the whole fairly healthy under current ammonia standards. However, we disagree that this is a reason not to undertake today's action. Our waters are healthy because they are not badly impacted by ammonia. By adopting today's ammonia standards, we identify, based on the best science, the standards that are necessary to maintain high quality waters where high quality waters now exist.

#### The Issue of Permit Limits

As we note above, we find that today's adopted standards are necessary to protect aquatic life generally in Illinois. Were this the sole issue before the Board, this proceeding would in all likelihood have been completed a long time ago, and the standards we adopt today would have been adopted significantly earlier.

The fact of the matter is that this has not happened, and it has not happened because water quality standards serve more than the one purpose of defining the ceiling concentration necessary to protect life in our streams and lakes. Water quality standards also serve the very practical purpose of being the beginning point for determining limits in discharge permits. It is in this second purpose, and in fears that permit limits might change as a result of modifying the standards, that the disagreement in this proceeding has been most pronounced.

The problem is essentially making practice comport with theory. The theory is that it is possible to determine the maximum amount that any discharger may discharge into a stream

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<sup>5</sup> The Board maintains a section in its water quality rules titled "Water Use Designations and Site Specific Water Quality Standards" at 35 Ill. Adm. Code Part 303. The Board promulgates the standards that are necessary to support special uses.

<sup>6</sup> The record is indeed full of anecdotal information regarding the success of fisherman in the General Use waters of Illinois.

by determining the maximum amount the discharger may release without causing the in-stream water quality standard to be exceeded. Unfortunately, the theory falls short in practice.

There are too many variables in most discharger/water body pairs to make simple associations between the discharger and in-stream water quality. Variations in the operations of the discharging plant, variations in discharge concentration, plus variations in stream flow, stream mixing, ambient in-stream concentrations, up-stream activities, and even season of the year, all contribute to the confounding of any simple relationship.

Nevertheless, difficult or not, it is necessary that it be determined how much anyone can discharge without causing the water quality standards to be violated. It is necessary because it is the law that discharges be limited so as not to cause or contribute to water quality violations. It is also the law that no one may discharge unless they have a permit that specifies the limits of their discharging (i.e., they must have an NPDES permit).

Under the Act, the Agency makes the determination of what limits are permissible in any Illinois NPDES permits. In turn, this Board reviews such Agency decisions that are contested. Moreover, the USEPA has oversight granted to it by Congress over all NPDES permits and may disapprove those that are found by USEPA to be inappropriate.

The permitting decision begins by the Agency noting the applicable water quality standard(s) and using this information, in combination with other stream-specific and discharger-specific information, to come up with requisite permit limits. There is an "Agency way" of doing this that involves a mass balance procedure. The Agency procedure is not necessarily the only way the requisite permit limits could be determined, nor is it necessarily the way permitting authorities in other states accomplish this task. It is, however, a procedure that is established and has the endorsement of the USEPA.

Clearly, from the earliest stages of this proceeding a principal and even sole concern of many of the participants from the regulated community has been that the Agency would use the proposed ammonia standards as the basis for imposing new, more stringent NPDES ammonia permit limits. More stringent NPDES permit limits could in turn require more extensive treatment and treatment facilities, each of which could impose a perceived unnecessary cost upon the discharger. This concern was certainly brought into focus when the Agency, at a hearing in November 1994, identified 20 municipal treatment facilities that, in the worst case, it believed would need to have the effluent limits in their NPDES permits adjusted downward, as a result of the new water quality standards, to such degree that additional treatment would be required.

This concern has been compounded by the fact that none of the dischargers are able to determine what NPDES permit limits they would face under the proposed rules, short of actually applying for a new NPDES permit under the new standards and seeing what permit limits would be derived by the Agency. Nor could they tell in advance what might provide a successful basis for challenge should they disagree with new permit limits. Thus, none of the

“target 20” could tell whether they were indeed a worst case example, or in fact whether there was any consequence to them at all.

Accordingly, a large part of the debate in this proceeding has focused on the methodology used by the Agency to derive permit limits from water quality standards. Indeed, uncertainty about this matter has been at the core of why this proceeding has taken so long. Although the Agency has included, in the record, guidelines that it follows in developing permits (See Exhs. 2L and 2M) and asserts that it intends to adopt regulations concerning the permitting procedures (Tr2. at 156; Tr3. at 261), the uncertainty still remains largely unaddressed.

The Board has had to weigh whether the proposed standards could in fact move forward, while the issue of permit calculating procedures remained uncertain. The Board determined at first notice and second notice that the standards could move forward because we found that protection of the environment requires adoption of the new standards and because we found that during the protracted course of these proceedings many of the problematic issues for most ammonia dischargers were resolved. We find so again today.

Some of the participants, particularly the Ammonia Group, have suggested that the Board itself adopt, as Board rules, procedures by which the Agency must calculate permit limits. We declined to do so. There are several reasons that support our decision, including that we are not ready today, in the absence of a record, to adopt or even consider for review such detailed, specific rules as would be necessary. Moreover, we are not today convinced that it is either appropriate or necessary to do so. The Agency is the State’s permitting authority, and we are reluctant to substantially alter the permitting structure in the way advocated without more justification than has yet been presented to us.

This is not to say, however, that we put the issue of permit calculating procedures to rest. Indeed, we fully expect to look very closely at all permit calculation procedures brought to us in any ammonia permit appeal and to demand that the procedures be completely justified. Moreover, we stand ready to develop Board standards for the determination of permit limits to the degree our authority under the Act allows and as circumstances require. The Board also notes that under Section 28.1 of the Act the Board is authorized to grant an adjusted standard for those who can support such an adjustment.

We finally note that the Ammonia Group also suggested that the Board provide by rule for the use of “scientifically defensible alternatives” to whatever water-quality based effluent limit procedure is used by the Agency. (PC 15(B) at 5.) The Board is not prepared at this time to do so, given that there is little evidence in the record to justify how details of this concept could be fashioned. However, as we note above, the Board intends to remain attentive to the ammonia permitting process and to whatever additional rulemaking efforts may be needed to assure that all NPDES permit limits are indeed “scientifically defensible”.



## Economic Impact

Costs and benefits are associated with both the ammonia standards and EMW provisions of today amendments.

Adoption of the new water quality standards may require some facilities to incur costs if the facilities need to upgrade or add nitrification to their wastewater treatment to comply with new, lower permit limits. We cannot, however, at this point be certain whether any facilities will definitely find themselves in this position.

As we noted, the Agency did, in the initial stages of this proceeding, identify 20 municipal wastewater treatment facilities that it then believed might need upgrading, as the worst case scenario. (Mosher at 34.) The Agency estimated that the total cost of upgrading all of these facilities would be approximately \$42 million. (Mosher at 34.) The Agency subsequently revised these figures downward to 11 facilities and a total cost of about \$20 million (Exh. 41 at 39), still as the worst-case scenario.

Whether these latest cost figures are likely to occur remains uncertain. Since the Agency's list includes only municipal dischargers, and some industrial discharges would conceivably also need treatment updates, the Agency figures may be underestimations. However, a number of the municipal dischargers that were on the Agency's list, particularly those located on the Fox River, have made some forceful arguments during the course of this proceeding that, notwithstanding the Agency's placing them on the list, they may not need to significantly upgrade their facilities to keep their receiving streams in compliance with the new standards.

Another factor that confounds our ability to calculate the actual cost of today's regulations is that some facilities will need to upgrade, including possibly adding additional ammonia removal capability, at some future date irrespective of whether the past or new standards are used. Ammonia removal occurs at facilities now because there are places where the safe ammonia carrying capacity of the receiving waters is taxed. As populations grow and discharge loadings increase, this will become progressively more the case whatever the in-stream ammonia standard may be. It would be inappropriate to totally attribute such growth-related needs for increased treatment to the small modifications of the ammonia standards today adopted.

While there may be costs associated with today's amendments, there are also distinct benefits. The new standards better protect Illinois' waterways now and for the future. This, in turn, promises a better, cleaner, healthier environment for the State. A healthier environment is an enormous benefit, albeit even more difficult to quantify than are the costs.

The benefits to the environment and the potential costs to some dischargers both stem from the portion of today's amendments dealing with standards: the standards protect the environment, but some dischargers may have to provide better treatment so that the standards are achieved. We find that the balance presented in the instant case is not unreasonable.

There is also a substantial benefit associated with adoption of the EMW provisions of today's amendments. Expiration of the winter ammonia exemption at 35 Ill. Adm. Code 304.301 has produced a circumstance where many major municipal dischargers will have to comply with lowered winter ammonia permit limits. In many of these cases, compliance with the lowered limits will have implementation costs. The EMW provisions would provide an exemption similar to that previously available under Section 304.301 and hence allow the implementation costs to be avoided. The Agency estimates these avoidance costs to be approximately \$157 million. (PC 12(B) at 11.)

### Effluent Modified Waters

Of particular import to today's amendments is the concept of EMW. This concept allows for environmental protection of those waterways needing protection at the same time that it minimizes the impact to dischargers to those waterways.

The Board recognizes that the standard treatment methodology for ammonia nitrogen is nitrification in a biological treatment plant, usually activated sludge. This treatment method does not assure compliance with the chronic ammonia standards at all times outside of a mixing zone, especially in small streams. The Board further recognizes that additional treatment would come at great cost and with little or no benefit. The concept of EMW is employed to ensure that well-run treatment plants are not found to be routinely in violation where no harm is done to the aquatic environment.

### Status of the Amendments under Federal Law

This proposal was accepted by the Board pursuant to Section 28.2 as a required rule to meet the requirements of the Clean Water Act. The Board is therefore required to adopt a rule that fully meets the applicable federal law and is consistent with Illinois statutes. The Board finds that today's amendments meet the requirements of the Clean Water Act.

### ORDER

The Board directs that the following amendments be submitted to the Secretary of State for final notice pursuant to Section 5-40 of the Illinois Administrative Procedure Act.

TITLE 35: ENVIRONMENTAL PROTECTION  
 SUBTITLE C: WATER POLLUTION  
 CHAPTER I: POLLUTION CONTROL BOARD

PART 302  
 WATER QUALITY STANDARDS

SUBPART A: GENERAL WATER QUALITY PROVISIONS

Section	
302.100	Definitions
302.101	Scope and Applicability
302.102	Allowed Mixing, Mixing Zones and ZIDs
302.103	Stream Flows
302.104	Main River Temperatures
302.105	Nondegradation

#### SUBPART B: GENERAL USE WATER QUALITY STANDARDS

Section	
302.201	Scope and Applicability
302.202	Purpose
302.203	Offensive Conditions
302.204	pH
302.205	Phosphorus
302.206	Dissolved Oxygen
302.207	Radioactivity
302.208	Numeric Standards for Chemical Constituents
302.210	Other Toxic Substances
302.211	Temperature
302.212	Ammonia Nitrogen and Un-ionized Ammonia
302.213	<u>Effluent Modified Waters (Ammonia)</u>

#### SUBPART C: PUBLIC AND FOOD PROCESSING WATER SUPPLY STANDARDS

Section	
302.301	Scope and Applicability
302.302	Algicide Permits
302.303	Finished Water Standards
302.304	Chemical Constituents
302.305	Other Contaminants
302.306	Fecal Coliform

#### SUBPART D: SECONDARY CONTACT AND INDIGENOUS AQUATIC LIFE STANDARDS

Section	
302.401	Scope and Applicability
302.402	Purpose
302.403	Unnatural Sludge
302.404	pH
302.405	Dissolved Oxygen

302.406	Fecal Coliform (Repealed)
302.407	Chemical Constituents
302.408	Temperature
302.409	Cyanide
302.410	Substances Toxic to Aquatic Life

#### SUBPART E: LAKE MICHIGAN WATER QUALITY STANDARDS

Section	
302.501	Scope and Applicability
302.502	Dissolved Oxygen
302.503	pH
302.504	Chemical Constituents
302.505	Fecal Coliform
302.506	Temperature
302.507	Existing Sources on January 1, 1971
302.508	Sources under Construction But Not in Operation on January 1, 1971
302.509	Other Sources

#### SUBPART F: PROCEDURES FOR DETERMINING WATER QUALITY CRITERIA

Section	
302.601	Scope and Applicability
302.603	Definitions
302.604	Mathematical Abbreviations
302.606	Data Requirements
302.612	Determining the Acute Aquatic Toxicity Criterion for an Individual Substance - General Procedures
302.615	Determining the Acute Aquatic Toxicity Criterion - Toxicity Independent of Water Chemistry
302.618	Determining the Acute Aquatic Toxicity Criterion - Toxicity Dependent on Water Chemistry
302.621	Determining the Acute Aquatic Toxicity Criterion - Procedures for Combinations of Substances
302.627	Determining the Chronic Aquatic Toxicity Criterion for an Individual Substance - General Procedures
302.630	Determining the Chronic Aquatic Toxicity Criterion - Procedure for Combination of Substances
302.633	The Wild and Domestic Animal Protection Criterion
302.642	The Human Threshold Criterion
302.645	Determining the Acceptable Daily Intake
302.648	Determining the Human Threshold Criterion
302.651	The Human Nonthreshold Criterion

302.654	Determining the Risk Associated Intake
302.657	Determining the Human Nonthreshold Criterion
302.658	Stream Flow for Application of Human Nonthreshold Criterion
302.660	Bioconcentration Factor
302.663	Determination of Bioconcentration Factor
302.666	Utilizing the Bioconcentration Factor
302.669	Listing of Derived Criteria

Appendix A References to Previous Rules

Appendix B Sources of Codified Sections

AUTHORITY: Implementing Section 13 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/13 and 27].

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 2 Ill. Reg. 44, p. 151, effective November 2, 1978; amended at 3 Ill. Reg. 20, p. 95, effective May 17, 1979; amended at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; codified at 6 Ill. Reg. 7818, amended at 6 Ill. Reg. 11161, effective September 7, 1982; amended at 6 Ill. Reg. 13750, effective October 26, 1982; peremptory amendments at 10 Ill. Reg. 461, effective December 23, 1985; amended in R87-27 at 12 Ill. Reg. 9911, effective May 27, 1988; amended in R85-29 at 12 Ill. Reg. 12082, effective July 11, 1988; amended in R88-1 at 13 Ill. Reg. 5998, effective April 18, 1989; amended in R88-21(A) at 14 Ill. Reg. 2899, effective February 13, 1990; amended in R88-21(B) at 14 Ill. Reg. 11974, effective July 9, 1990; amended in R94-1(A) at 20 Ill. Reg. 7682, effective May 24, 1996; amended in R94-1(B) at \_\_\_\_\_ Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_

BOARD NOTE: This Part implements the Illinois Environmental Protection Act as of July 1, 1994.

Section 302.202 Purpose

The General Use standards will protect the State's water for aquatic life (except as provided in Section 302.213), wildlife, agricultural use, secondary contact use and most industrial uses and ensure the aesthetic quality of the State's aquatic environment. Primary contact uses are protected for all General Use waters whose physical configuration permits such use.

(Source: Amended at \_\_\_ Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_)

Section 302.212 Total Ammonia Nitrogen and Un-ionized Ammonia

- a) Total ammonia ~~Ammonia~~-nitrogen (as N: STORET ~~Storet~~ Number 3161600610) shall in no case exceed 15 mg/L.

- ~~b) If ammonia nitrogen is less than 15 mg/l and greater than or equal to 1.5 mg/l, then un-ionized ammonia (as N) shall not exceed 0.04 mg/l.~~
- b) Un-ionized ammonia nitrogen (as N: STORET Number 00612) shall not exceed the acute and chronic standards given below subject to the provisions of Section 302.208(a) and (b), and Section 302.213 of this Part.
- 1) From April through October, the Acute Standard (AS) shall be 0.33 mg/L and the Chronic Standard (CS) shall be 0.057 mg/L.
  - 2) From November through March, the AS shall be 0.14 mg/L and the CS shall be 0.025 mg/L.
- ~~c) Ammonia nitrogen concentrations of less than 1.5 mg/l are lawful regardless of un-ionized ammonia concentration.~~
- cd) For purposes of this Section, the concentration of un-ionized ammonia nitrogen as N and total ammonia nitrogen as N shall be computed according to the following equations:

$$U = \frac{1.0013N}{(1 + 10^X)}$$

$$U = \frac{N}{[0.94412(1 + 10^X) + 0.0559]}$$

$$\text{and } N = U [0.94412(1 + 10^X) + 0.0559]$$

$$\text{where: } X = 0.09018 + \frac{2729.92}{(T + 273.16)} - \text{pH}$$

U = Concentration of un-ionized ammonia as N in mg/L

N = Concentration of ammonia nitrogen as N in mg/L

T = Temperature in degrees Celsius

- de) The following tables indicates the maximum total ammonia nitrogen concentrations (mg/L as N) allowable pursuant to subsections (a) and (b) of this Section for certain combinations of pH and temperature:

AMMONIA NITROGEN  
WATER QUALITY STANDARD (mg/l)

TEMP.		pH						
<u>°C</u>	<u>(°F)</u>	<u>6.0</u>	<u>6.5</u>	<u>7.0</u>	<u>7.5</u>	<u>8.0</u>	<u>8.5</u>	<u>9.0</u>
5	(41)	15	15	15	9.6	3.1	1.5	1.5
10	(50)	15	15	15	6.5	2.1	1.5	1.5
15	(59)	15	15	13.9	4.4	1.5	1.5	1.5
20	(68)	15	15	9.6	3.1	1.5	1.5	1.5
25	(77)	15	15	6.7	2.1	1.5	1.5	1.5
30	(86)	15	14.9	4.7	1.5	1.5	1.5	1.5
35	(95)	15	10.7	3.4	1.5	1.5	1.5	1.5

1) Summer (April through October) Acute un-ionized ammonia 0.33 mg/L

<u>°F</u>	pH <u>°C</u>	<u>6.5</u>	<u>7.0</u>	<u>7.5</u>	<u>7.75</u>	<u>8.0</u>	<u>8.25</u>	<u>8.5</u>	<u>9.0</u>
		<u>55</u>	<u>12.8</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>13.8</u>	<u>7.9</u>
<u>60</u>	<u>15.6</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>11.2</u>	<u>6.5</u>	<u>3.8</u>	<u>1.4</u>
<u>65</u>	<u>18.3</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>9.8</u>	<u>5.3</u>	<u>3.1</u>	<u>1.2</u>
<u>70</u>	<u>21.1</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>13.2</u>	<u>7.6</u>	<u>4.4</u>	<u>2.6</u>	<u>1.1</u>
<u>75</u>	<u>23.9</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>10.9</u>	<u>6.3</u>	<u>3.7</u>	<u>2.2</u>	<u>0.9</u>
<u>80</u>	<u>26.7</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>9.0</u>	<u>5.2</u>	<u>3.1</u>	<u>1.9</u>	<u>0.8</u>
<u>85</u>	<u>29.4</u>	<u>15.0</u>	<u>15.0</u>	<u>13.1</u>	<u>7.5</u>	<u>4.4</u>	<u>2.6</u>	<u>1.6</u>	<u>0.7</u>
<u>90</u>	<u>32.2</u>	<u>15.0</u>	<u>15.0</u>	<u>10.9</u>	<u>6.3</u>	<u>3.7</u>	<u>2.2</u>	<u>1.4</u>	<u>0.7</u>

2) Summer (April through October) Chronic un-ionized ammonia 0.057 mg/L

<u>°F</u>	pH <u>°C</u>	<u>6.5</u>	<u>7.0</u>	<u>7.5</u>	<u>7.75</u>	<u>8.0</u>	<u>8.25</u>	<u>8.5</u>	<u>9.0</u>
		<u>55</u>	<u>12.8</u>	<u>15.0</u>	<u>15.0</u>	<u>7.4</u>	<u>4.2</u>	<u>2.4</u>	<u>1.4</u>
<u>60</u>	<u>15.6</u>	<u>15.0</u>	<u>15.0</u>	<u>7.0</u>	<u>3.4</u>	<u>1.9</u>	<u>1.1</u>	<u>0.7</u>	<u>0.2</u>
<u>65</u>	<u>18.3</u>	<u>15.0</u>	<u>15.0</u>	<u>4.9</u>	<u>2.8</u>	<u>1.6</u>	<u>0.9</u>	<u>0.5</u>	<u>0.2</u>
<u>70</u>	<u>21.1</u>	<u>15.0</u>	<u>12.6</u>	<u>4.0</u>	<u>2.3</u>	<u>1.3</u>	<u>0.8</u>	<u>0.5</u>	<u>0.2</u>
<u>75</u>	<u>23.9</u>	<u>15.0</u>	<u>10.3</u>	<u>3.3</u>	<u>1.9</u>	<u>1.1</u>	<u>0.6</u>	<u>0.4</u>	<u>0.2</u>
<u>80</u>	<u>26.7</u>	<u>15.0</u>	<u>8.6</u>	<u>2.7</u>	<u>1.6</u>	<u>0.9</u>	<u>0.5</u>	<u>0.3</u>	<u>0.1</u>
<u>85</u>	<u>29.4</u>	<u>15.0</u>	<u>7.8</u>	<u>2.3</u>	<u>1.3</u>	<u>0.8</u>	<u>0.4</u>	<u>0.3</u>	<u>0.1</u>
<u>90</u>	<u>32.2</u>	<u>15.0</u>	<u>5.8</u>	<u>1.9</u>	<u>1.1</u>	<u>0.6</u>	<u>0.4</u>	<u>0.2</u>	<u>0.1</u>

3) Winter (November through March) Acute un-ionized ammonia 0.14 mg/L

<u>°F</u>	<u>pH</u> <u>°C</u>	<u>6.5</u>	<u>7.0</u>	<u>7.5</u>	<u>7.75</u>	<u>8.0</u>	<u>8.25</u>	<u>8.5</u>	<u>9.0</u>
		<u>32</u>	<u>0.0</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>9.2</u>
<u>35</u>	<u>1.7</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>14.1</u>	<u>8.0</u>	<u>4.5</u>	<u>1.5</u>
<u>40</u>	<u>4.4</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>11.3</u>	<u>6.4</u>	<u>3.7</u>	<u>1.3</u>
<u>45</u>	<u>7.2</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>9.0</u>	<u>5.1</u>	<u>2.9</u>	<u>1.0</u>
<u>50</u>	<u>10.0</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>12.8</u>	<u>7.3</u>	<u>4.1</u>	<u>2.4</u>	<u>0.9</u>
<u>55</u>	<u>12.8</u>	<u>15.0</u>	<u>15.0</u>	<u>15.0</u>	<u>10.3</u>	<u>5.9</u>	<u>3.4</u>	<u>2.0</u>	<u>0.7</u>
<u>60</u>	<u>15.6</u>	<u>15.0</u>	<u>15.0</u>	<u>14.8</u>	<u>8.4</u>	<u>4.8</u>	<u>2.7</u>	<u>1.6</u>	<u>0.6</u>

4) Winter (November through March) Chronic un-ionized ammonia 0.025mg/L

<u>°F</u>	<u>pH</u> <u>°C</u>	<u>6.5</u>	<u>7.0</u>	<u>7.5</u>	<u>7.75</u>	<u>8.0</u>	<u>8.25</u>	<u>8.5</u>	<u>9.0</u>
		<u>32</u>	<u>0.0</u>	<u>15.0</u>	<u>15.0</u>	<u>9.1</u>	<u>5.1</u>	<u>2.9</u>	<u>1.6</u>
<u>35</u>	<u>1.7</u>	<u>15.0</u>	<u>15.0</u>	<u>7.9</u>	<u>4.4</u>	<u>2.5</u>	<u>1.4</u>	<u>0.8</u>	<u>0.3</u>
<u>40</u>	<u>4.4</u>	<u>15.0</u>	<u>15.0</u>	<u>6.3</u>	<u>3.6</u>	<u>2.0</u>	<u>1.1</u>	<u>0.7</u>	<u>0.2</u>
<u>45</u>	<u>7.2</u>	<u>15.0</u>	<u>15.0</u>	<u>5.0</u>	<u>2.8</u>	<u>1.6</u>	<u>0.9</u>	<u>0.5</u>	<u>0.2</u>
<u>50</u>	<u>10.0</u>	<u>15.0</u>	<u>12.7</u>	<u>4.0</u>	<u>2.3</u>	<u>1.3</u>	<u>0.7</u>	<u>0.4</u>	<u>0.2</u>
<u>55</u>	<u>12.8</u>	<u>15.0</u>	<u>10.2</u>	<u>3.3</u>	<u>1.8</u>	<u>1.0</u>	<u>0.6</u>	<u>0.3</u>	<u>0.1</u>
<u>60</u>	<u>15.6</u>	<u>15.0</u>	<u>8.3</u>	<u>2.6</u>	<u>1.5</u>	<u>0.9</u>	<u>0.5</u>	<u>0.3</u>	<u>0.1</u>

(Source: Amended at \_\_\_ Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_)

Section 302.213 Effluent Modified Waters (Ammonia)

- a) Effluent modified waters are those waters or portions of waters that the Agency has determined, pursuant to 35 Ill. Adm. Code 309: Subpart A, to have the potential to exceed, and are therefore not subject to, the chronic ammonia standards of Section 302.212(b) downstream of an effluent outfall and outside of any allowable mixing zone. The Agency shall not identify a waterbody as an effluent modified water if it:
- 1) has uses known to be adversely impacted by ammonia as designated under 35 Ill. Adm. Code 303.201 outside of any allowable mixing zone;  
or
  - 2) exceeds the acute standard of Section 302.212(b) of this Part.
- b) All effluent discharges to an effluent modified water must meet the requirements of 35 Ill. Adm. Code 304.122(d) prior to dilution with the receiving water.

(Source: Added at \_\_\_ Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_)



PART 304  
EFFLUENT STANDARDS

SUBPART A: GENERAL EFFLUENT STANDARDS

Section	
304.101	Preamble
304.102	Dilution
304.103	Background Concentrations
304.104	Averaging
304.105	Violation of Water Quality Standards
304.106	Offensive Discharges
304.120	Deoxygenating Wastes
304.121	Bacteria
304.122	<u>Total Ammonia Nitrogen (as N: STORET number 00610)</u>
304.123	Phosphorus (STORET number 00665)
304.124	Additional Contaminants
304.125	pH
304.126	Mercury
304.140	Delays in Upgrading (Repealed)
304.141	NPDES Effluent Standards
304.142	New Source Performance Standards (Repealed)

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

Section	
304.201	Wastewater Treatment Plant Discharges of the Metropolitan Sanitary District of Greater Chicago
304.202	Chlor-alkali Mercury Discharges in St. Clair County
304.203	Copper Discharges by Olin Corporation
304.204	Schoenberger Creek: Groundwater Discharges
304.205	John Deere Foundry Discharges
304.206	Alton Water Company Treatment Plant Discharges
304.207	Galesburg Sanitary District Deoxygenating Wastes Discharges
304.208	City of Lockport Treatment Plant Discharges
304.209	Wood River Station Total Suspended Solids Discharges
304.210	Alton Wastewater Treatment Plant Discharges
304.211	Discharges From Borden Chemicals and Plastics Operating Limited Partnership Into an Unnamed Tributary of Long Point Slough
304.212	Sanitary District of Decatur Discharges
304.213	UNO-VEN Refinery Ammonia Discharge
304.214	Mobil Oil Refinery Ammonia Discharge
304.215	City of Tuscola Wastewater Treatment Facility Discharges

304.216	Newton Station Suspended Solids Discharges
304.218	City of Pana Phosphorus Discharge
304.219	North Shore Sanitary District phosphorus Discharges
304.220	East St. Louis Treatment Facility, Illinois-American Water Company
304.221	Ringwood Drive Manufacturing Facility in McHenry County
304.222	Intermittent Discharge of TRC

#### SUBPART C: TEMPORARY EFFLUENT STANDARDS

##### Section

304.301	Exception for Ammonia Nitrogen Water Quality Violations ( <u>Repealed</u> )
304.302	City of Joliet East Side Wastewater Treatment Plant
304.303	Amerock Corporation, Rockford Facility

##### Appendix A References to Previous Rules

AUTHORITY: Implementing Section 13 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/13 and 27].

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 2 Ill. Reg. 30, p. 343, effective July 27, 1978; amended at 2 Ill. Reg. 44, p. 151, effective November 2, 1978; amended at 3 Ill. Reg. 20, p. 95, effective May 17, 1979; amended at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; amended at 4 Ill. Reg. 20, p. 53 effective May 7, 1980; amended at 6 Ill. Reg. 563, effective December 24, 1981; codified at 6 Ill. Reg. 7818; amended at 6 Ill. Reg. 11161, effective September 7, 1982; amended at 6 Ill. Reg. 13750, effective October 26, 1982; amended at 7 Ill. Reg. 3020, effective March 4, 1983; amended at 7 Ill. Reg. 8111, effective June 23, 1983; amended at 7 Ill. Reg. 14515, effective October 14, 1983; amended at 7 Ill. Reg. 14910, effective November 14, 1983; amended at 8 Ill. Reg. 1600, effective January 18, 1984; amended at 8 Ill. Reg. 3687, effective March 14, 1984; amended at 8 Ill. Reg. 8237, effective June 8, 1984; amended at 9 Ill. Reg. 1379, effective January 21, 1985; amended at 9 Ill. Reg. 4510, effective March 22, 1985; peremptory amendment at 10 Ill. Reg. 456, effective December 23, 1985; amended at 11 Ill. Reg. 3117, effective January 28, 1987; amended in R84-13 at 11 Ill. Reg. 7291 effective April 3, 1987; amended in R86-17(A) at 11 Ill. Reg. 14748, effective August 24, 1987; amended in R84-16 at 12 Ill. Reg. 2445, effective January 15, 1988; amended in R83-23 at 12 Ill. Reg. 8658, effective May 10, 1988; amended in R87-27 at 12 Ill. Reg. 9905, effective May 27, 1988; amended in R82-7 at 12 Ill. Reg. 10712, effective June 9, 1988; amended in R85-29 at 12 Ill. Reg. 12064, effective July 12, 1988; amended in R87-22 at 12 Ill. Reg. 13966, effective August 23, 1988; amended in R86-3 at 12 Ill. Reg. 20126, effective November 16, 1988; amended in R84-20 at 13 Ill. Reg. 851, effective January 9, 1989; amended in R85-11 at 13 Ill. Reg. 2060, effective February 6, 1989; amended in R88-1 at 13 Ill. Reg. 5976, effective April 18, 1989; amended in R86-17B at 13 Ill. Reg. 7754, effective May 4, 1989; amended in R88-22 at 13 Ill. Reg. 8880, effective May 26, 1989; amended in R87-6 at 14 Ill. Reg. 6777, effective April 24, 1990; amended in R87-36 at 14 Ill. Reg. 9437, effective May 31, 1990; amended in R 88-21(B) at 14 Ill. Reg. 12538, effective July 18, 1990; amended in R84-44 at 14 Ill. Reg. 20719, effective December

11, 1990; amended in R86-14 at 15 Ill. Reg. 241, effective December 18, 1990; amended in R93-8 at 18 Ill. Reg. 11574, effective July 7, 1994; amended in R87-33 at 18 Ill. Reg. 11574, effective July 7, 1994; amended in R95-14 at 20 Ill. Reg. 3528, effective February 8, 1996; amended in R94-1(B) at 20 Ill. Reg. \_\_\_\_\_, effective

BOARD NOTE: This Part implements the Illinois Environmental Protection Act as of July 1, 1994.

Section 304.122 Total Ammonia Nitrogen (as N: STORET number 00610)

- a) No effluent from any source which discharges to the Illinois River, the Des Plaines River downstream of its confluence with the Chicago River System or the Calumet River System, and whose untreated waste load is 50,000 or more population equivalents shall contain more than 2.5 mg/l of total ammonia nitrogen as N during the months of April through October, or 4 mg/l at other times.
- b) Sources discharging to any of the above waters and whose untreated waste load cannot be computed on a population equivalent basis comparable to that used for municipal waste treatment plants and whose total ammonia nitrogen as N discharge exceeds 45.4 kg/day (100 pounds per day) shall not discharge an effluent of more than 3.0 mg/l of total ammonia nitrogen as N.
- c) In addition to the effluent standards set forth in subsections (a) and (b) of this Section, all sources are subject to Section 304.105 unless the Agency determines as part of the NPDES Permit Program under 35 Ill. Adm. Code 309: Subpart A that alternate effluent standards are applicable pursuant to subsection (d) of this Section.
- d) All dischargers to effluent modified waters as defined at 35 Ill. Adm. Code 302.213, except for treatment works qualifying under Section 304.120(c), shall have an effective NPDES permit with monthly average effluent limits of 1.5 mg/L total ammonia as N during the months of April through October, and 4.0 mg/L total ammonia as N at other times, as well as the following restrictions:
  - 1) Dischargers achieving lower ammonia concentrations than given above, yet not meeting the chronic water quality standards of 35 Ill. Adm. Code 302.212(b), shall maintain their existing level of performance consistent with the facility's expected organic and hydraulic loadings for the duration of their NPDES permit.
  - 2) New or expanded discharges that increase ammonia loading to general use waters and/or create effluent modified waters or portions of waters must demonstrate compliance to the Agency with the nondegradation requirements at 35 Ill. Adm. Code 302.105.

(Source: Amended at \_\_\_ Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_)

SUBPART C: TEMPORARY EFFLUENT STANDARDS

Section 304.301 Exception for Ammonia Nitrogen Water Quality Violations (Repealed)

- ~~a) Section 304.105 shall not apply to 35 Ill. Adm. Code 302.212 for any source during the months of November through March; except that during the months of November through March no source shall discharge an effluent containing a concentration of ammonia nitrogen greater than 4.0 mg/l if the discharge, alone or in combination with other discharges, causes or contributes to a violation of 35 Ill. Adm. Code 302.212.~~
- ~~b) Compliance with the provisions of subsection (a) shall be achieved by March 31, 1979, or such other date as required by NPDES permit, or as ordered by the Board Under Title VIII or Title IX of the Environmental Protection Act.~~
- ~~c) After July 1, 1991, the exemption provided in this Section shall terminate.~~

(Source: Repealed at \_\_\_ Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_)

IT IS SO ORDERED.

Board Member K.M. Hennessey abstained.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above opinion and order was adopted on the \_\_\_\_\_ day of \_\_\_\_\_, 1996 by a vote of \_\_\_\_\_.

\_\_\_\_\_  
Dorothy M. Gunn, Clerk  
Illinois Pollution Control Board