

ILLINOIS POLLUTION CONTROL BOARD
December 6, 1989

IN THE MATTER OF:)
)
PROPOSED AMENDMENTS TO TITLE) R88-21, DOCKET A
35, SUBTITLE C (TOXICS CONTROL))

PROPOSED REGULATIONS SECOND NOTICE

ORDER OF THE BOARD (by R. C. Flemal)

The Board hereby proposes for Second Notice the following amendments to 35 Ill. Adm. Code, Subtitle C: Water Pollution, Chapter I, Pollution Control Board, Parts 301, 302, 303, 305, and 309. The Board hereby directs that Second Notice of the following proposed rules be submitted to the Joint Committee on Administrative Rules. This Order is supported by a separate Opinion adopted this day.

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

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APPENDIX A	References to Previous Rules

AUTHORITY: Implementing Section 13 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1987, ch. 111 1/2, pars. 1013 and 1027).

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; amended at 5 Ill. Reg. 6384, effective May 28, 1981; codified at 6 Ill. Reg. 7818; amended in R88-1 at 13 Ill. Reg. 5984, effective April 18, 1989; amended in R88-21(A) at _____ Ill. Reg. _____, effective _____.

Note: Capitalization denotes statutory language

Section 301.106 Incorporations by Reference

- a) Abbreviations. The following abbreviated names are used for materials incorporated by reference:

"ASTM" means American Society for Testing and

Materials

"GPO" means Superintendent of Documents, U.S. Government Printing Office

"NTIS" means National Technical Information Service

"Standard Methods" means "Standard Methods for the Examination of Water and Wastewater:", Available from the American Public Health Association

"USEPA" means United States Environmental Protection Agency

b) The Board incorporates the following publications by reference:

American Public Health Association et al., 1015 Fifteenth Street, N.W., Washington, D.C. 20005

Standard Methods for the Examination of Water and Wastewater, 16th Edition, 1985

ASTM. American Society for Testing and Materials, 1976 Race Street, Philadelphia, PA 19013 (215) 299-5400

ASTM Standard E 724-80 "Standard Practice for Conducting Static Acute Toxicity Tests with Larvae of Four Species of Bivalve Molluscs", approved 1980.

ASTM Standard E 729-80 "Standard Practice for Conducting Static Acute Toxicity Tests with Fishes, Macroinvertebrates, and Amphibians", approved 1980.

ASTM Standard E 857-81 "Standard Practice for Conducting Subacute Dietary Toxicity Tests with Avian Species", approved 1981.

ASTM Standard E 1023-84 "Standard Guide for Assessing the Hazard of a Material to Aquatic Organisms and Their Uses", approved 1984.

ASTM Standard E 1103-86 "Method for Determining Subchronic Dermal Toxicity", approved 1986.

ASTM Standard E 1147-87 "Standard Test Method for Partition Coefficient (n-Octanol/Water) Estimation by Liquid Chromatography", approved February 27, 1987

ASTM Standard E 1192-88 "Standard Guide for Conducting Acute Toxicity Tests on Aqueous Effluents with Fishes, Macroinvertebrates and Amphibians", approved 1988.

ASTM Standard E 1193-87 "Standard Guide for Conducting Renewal Life-Cycle Toxicity Tests with Daphnia Magna", approved 1987.

ASTM Standard E 1241-88 "Standard Guide for Conducting Early Life-Stage Toxicity Tests with Fishes", approved 1988.

ASTM Standard E 1242-88 "Standard Practice for Using Octanol-Water Partition Coefficients to Estimate Median Lethal Concentrations for Fish due to Narcosis", approved 1988.

ASTM Standard E 4429-84 "Standard Practice for Conducting Static Acute Toxicity Tests on Wastewaters with Daphnia", approved 1984.

NTIS. National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 (703) 487-4600

SIDES: STORET Input Data Editing System, January, 1973, Document Number PB-227 052/8

Water Quality Data Base Management Systems, February, 1984, Document Number AD-P004 768/8

USEPA. United States Environmental Protection Agency, Office of Health and Environmental Assessment, Washington, D.C. 20460

Mutagenicity and Carcinogenicity Assessment for 1,3-Butadiene, September, 1985, Document Number EPA/600/8-85/004A

c) The Board incorporates the following federal regulations by reference:

40 CFR 136 (1988)

40 CFR 141 (1988)

40 CFR 302.4 (1988)

d) This Section incorporates no future editions or amendments.

(Source: Added at _____ Ill. Reg. _____,
effective _____)

Section 301.107 Severability

If any provision of this Subtitle is adjudged invalid, or if the application thereof to any person or in any circumstance is adjudged invalid, such invalidity shall not affect the validity of this Subtitle as a whole, or any Part, Subpart, Section, subsection, sentence or clause thereof not adjudged invalid.

(Source: Added at _____ Ill. Reg. _____,
effective _____)

Section 301.108 Adjusted Standards

- a) AFTER ADOPTING A REGULATION OF GENERAL APPLICABILITY, THE BOARD MAY GRANT, IN A SUBSEQUENT ADJUDICATORY DETERMINATION, AN ADJUSTED STANDARD FOR PERSONS WHO CAN JUSTIFY SUCH AN ADJUSTMENT CONSISTENT WITH SUBSECTION (a) OF SECTION 27 OF THE ILLINOIS ENVIRONMENTAL PROTECTION ACT. IN GRANTING SUCH ADJUSTED STANDARDS, THE BOARD MAY IMPOSE SUCH CONDITIONS AS MAY BE NECESSARY TO ACCOMPLISH THE PURPOSES OF THE ILLINOIS ENVIRONMENTAL PROTECTION ACT. THE RULE-MAKING PROVISIONS OF THE ILLINOIS ADMINISTRATIVE PROCEDURE ACT (Ill. Rev. Stat. 1987, ch. 127, par. 1001 et seq) AND TITLE VII OF THE ENVIRONMENTAL PROTECTION ACT SHALL NOT APPLY TO SUCH SUBSEQUENT DETERMINATIONS. (Section 28.1(a) of the Act)

- b) IN ADOPTING A RULE OF GENERAL APPLICABILITY, THE BOARD MAY SPECIFY THE LEVEL OF JUSTIFICATION REQUIRED OF A PETITIONER FOR AN ADJUSTED STANDARD CONSISTENT WITH THIS SECTION. (Section 28.1(b) of the Act)

- c) IF A REGULATION OF GENERAL APPLICABILITY DOES NOT SPECIFY A LEVEL OF JUSTIFICATION REQUIRED OF A PETITIONER TO QUALIFY FOR AN ADJUSTED STANDARD, THE BOARD MAY GRANT INDIVIDUAL ADJUSTED STANDARDS WHENEVER THE BOARD DETERMINES UPON ADEQUATE PROOF BY PETITIONER, THAT:
 - 1) FACTORS RELATING TO THAT PETITIONER ARE SUBSTANTIALLY AND SIGNIFICANTLY DIFFERENT FROM THE FACTORS RELIED UPON BY THE BOARD IN ADOPTING THE GENERAL REGULATION APPLICABLE TO THAT PETITIONER;

 - 2) THE EXISTENCE OF THOSE FACTORS JUSTIFIES AN ADJUSTED STANDARD;

 - 3) THE REQUESTED STANDARD WILL NOT RESULT IN ENVIRONMENTAL OR HEALTH EFFECTS SUBSTANTIALLY AND SIGNIFICANTLY MORE ADVERSE THAN THE EFFECTS CONSIDERED BY THE BOARD IN ADOPTING THE RULE OF GENERAL APPLICABILITY; AND

4) THE ADJUSTED STANDARD IS CONSISTENT WITH ANY
APPLICABLE FEDERAL LAW.

(Section 28.1(c) of the Act)

(Source: Added at _____ Ill. Reg. _____,
effective _____)

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE C: WATER POLLUTION
CHAPTER 1: POLLUTION CONTROL BOARD

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WATER QUALITY STANDARDS

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- 302.606 Data Requirements
- 302.612 Determining the Acute Aquatic Toxicity Criterion for an Individual Substance - General Procedures
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- 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 (Ill. Rev. Stat. 1987, ch. 111 1/2, pars. 1013 and 1027).

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. 7218, effective June 22, 1982; amended at 6 Ill. Reg. 11161, effective September 7, 1982; amended at 6 Ill. Reg. 13750, effective October 26, 1982; amended at 8 Ill. Reg. 1629, effective January 18, 1984; 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 _____ Ill. Reg. _____, effective _____.

SUBPART A: GENERAL WATER QUALITY PROVISIONS

Section 302.100 Definitions

Unless otherwise specified, the definitions of the Environmental Protection Act (Ill. Rev. Stat. 1987, ch. 111 1/2, par. 1001 et seq.) and 35 Ill. Adm. Code 301 apply to this Part. As used in this Part, the following definitions have the specified meaning.

"Acute Toxicity" means the capacity of any substance or combination of substances to cause mortality or other adverse effects in an organism resulting from a single or short-term exposure to the substance.

"Adverse Effect" means any gross or overt effect on an organism, including but not limited to reversible histopathological damage, severe convulsions, irreversible functional impairment and lethality, as well as any non-overt effect on an organism resulting in functional impairment or pathological lesions which may affect the performance of the whole organism, or which reduces an organism's ability to respond to an additional challenge.

"Chronic Toxicity" means the capacity of any substance or combination of substances to cause injurious or debilitating effects in an organism which result from exposure for a time period representing a substantial portion of the natural life cycle of that organism, including but not limited to the growth phase, the reproductive phases or such critical portions of the natural life cycle of that organism.

"Criterion" means the numerical concentration of one or more toxic substances derived in accordance with the procedures in Subpart F which, if not exceeded, would assure compliance with the narrative toxicity standard of Section 302.210.

"Hardness" means a water quality parameter or characteristic consisting of the sum of calcium and magnesium concentrations expressed in terms of equivalent milligrams per liter as calcium carbonate. Hardness is measured in accordance with methods specified in 40 CFR 136, incorporated by reference in 35 Ill. Adm. Code 301.106.

"Mixing Zone" means a portion of the waters of the State identified as a region within which mixing is allowed pursuant to Section 302.102(d).

"Total Residual Chlorine" or "TRC" means those substances which include combined and uncombined forms

of both chlorine and bromine and which are expressed, by convention, as an equivalent concentration of molecular chlorine. TPCs are measured in accordance with methods specified in 40 CFR 136, incorporated by reference in 35 Ill. Adm. Code 301.105.

"Toxic Substance" means a chemical substance which causes adverse effects in humans, or in aquatic or terrestrial animal or plant life. Toxic substances include, but are not limited to those substances listed in 40 CFR 302.4, incorporated by reference in 35 Ill. Adm. Code 301.106, or any "chemical substance" as defined by the Illinois Chemical Safety Act (Ill. Rev. Stat. 1987, ch. 111, par. 951 et seq.)

"ZID" or "Zone of Initial Dilution" means a portion of a mixing zone, identified pursuant to Section 302.102(a), within which acute toxicity standards need not be met.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.101 Scope and Applicability

- a) Part 302This Part contains schedules of water quality standards which are applicable throughout the State as designated in Part 35 Ill. Adm. Code 303. Site specific water quality standards are found with the water use designations in Part 35 Ill. Adm. Code 303.
- b) Subpart B contains general use water quality standards which must be met in waters of the State for which there is no specific designation (Section 35 Ill. Adm. Code 303.201).
- c) Subpart C contains the public and food processing water supply standards. These are cumulative with Subpart B and must be met by all designated waters at the point at which water is drawn for treatment and distribution as a potable supply or for food processing (Section 35 Ill. Adm. Code 303.202).
- d) Subpart D contains the secondary contact and indigenous aquatic life standards. These standards must be met only by certain waters designated in Section 35 Ill. Adm. Code 303.204 and 303.441.
- e) Subpart E contains the Lake Michigan water quality standards. These are cumulative with the Subpart B and C standards and must be met by the waters of Lake Michigan and such other waters as may be designated in Part 35 Ill Adm. Code 303 (Section 35 Ill. Adm. Code 303.443).

f) Subpart F contains the procedures for determining each of the criteria designated in Section 302.210.

f)g) Unless the contrary is clearly indicated, all references to "Parts" or "Sections" are to Ill. Adm. Code, Title 35: Environmental Protection. For example, "Part 309" is 35 Ill. Adm. Code 309, and "Section 309.101" is 35 Ill. Adm. Code 309.101.

(Source: Amended at _____ Ill. Reg. _____, effective _____)

Section 302.102 Allowed Mixing, Mixing Zones and ZIDs

- a) In the application of this Chapter, whenever a water quality standard is more restrictive than its corresponding effluent standard, or where there is no corresponding effluent standard specified at 35 Ill. Adm. Code 304, then an opportunity shall be allowed for the compliance with 35 Ill. Adm. Code 304.105 by mixture of an effluent with its receiving waters, provided the discharger has made every effort to comply with the requirements of 35 Ill. Adm. Code 304.102. Water quality standards must be met at every point outside of the mixing zone. The size of the mixing zone cannot be uniformly prescribed. The governing principle is that the proportion of any body of water or segment thereof within mixing zones must be quite small if the water quality standards are to have any meaning. This principle shall be applied on a case-by-case basis to ensure that neither any individual source nor the aggregate of sources shall cause excessive zones to exceed the standards. The water quality standards must be met in the bulk of the body of water, and no body of water may be used totally as a mixing zone for a single outfall or combination of outfalls. Moreover, except as otherwise provided in this Chapter, no single mixing zone shall exceed the area of a circle with a radius of 183 m (600 feet). Single sources of effluents which have more than one outfall shall be limited to a total mixing area no larger than that allowable if a single outfall were used.
- b) In determining the size of the mixing zone for any discharge, the following must be considered: The portion, volume and area of any receiving waters within which mixing is allowed pursuant to subsection (a) shall be limited by the following:
- 1) The character of the body of water, Mixing must be confined in an area or volume of the receiving water no larger than the area or volume which would result after incorporation of outfall design measures to attain optimal mixing efficiency of

effluent and receiving waters. Such measures may include, but are not limited to, use of diffusers and engineered location and configuration of discharge points.

- 2) the present and anticipated future use of the body of water; Mixing is not allowed in waters which include a tributary stream entrance if such mixing occludes the tributary mouth or otherwise restricts the movement of aquatic life into or out of the tributary.
- 3) the present and anticipated water quality of the body of water; Mixing is not allowed in waters adjacent to bathing beaches, bank fishing areas, boat ramps or dockages or any other public access area.
- 4) the effect of the discharge on the present and anticipated future water quality; Mixing is not allowed in waters containing mussel beds, endangered species habitat, fish spawning areas, areas of important aquatic life habitat, or any other natural features vital to the well being of aquatic life in such a manner that the maintenance of aquatic life in the body of water as a whole would be adversely affected.
- 5) the dilution ratio; and Mixing is not allowed in waters which contain intake structures of public or food processing water supplies, points of withdrawal of water for irrigation, or watering areas accessed by wild or domestic animals.
- 6) the nature of the contaminant; Mixing must allow for a reasonable zone of passage for aquatic life in which water quality standards are met.
- 7) The area and volume in which mixing occurs, alone or in combination with other areas and volumes of mixing, must not intersect any area or volume of any body of water in such a manner that the maintenance of aquatic life in the body of water as a whole would be adversely affected.
- 8) The area and volume in which mixing occurs, alone or in combination with other areas and volumes of mixing, must not contain more than 25% of the cross-sectional area or volume of flow of a stream except for those streams where the dilution ratio is less than 3:1. Mixing is not allowed in receiving waters which have a zero minimum seven day low flow which occurs once in ten years.

- 9) No mixing is allowed where the water quality standard for the constituent is question is already violated in the receiving water.
 - 10) No body of water may be used totally for mixing of a single outfall or combination of outfalls.
 - 11) Single sources of effluents which have more than one outfall shall be limited to a total area and volume of mixing no larger than that allowable if a single outfall were used.
 - 12) The area and volume in which mixing occurs must be as small as is practicable under the limitations prescribed in this subsection, and in no circumstances may the mixing encompass a surface area larger than 26 acres.
- c) In addition to the above, the mixing zone shall be so designed as to assure a reasonable zone of passage for aquatic life in which the water quality standards are met. The mixing zone shall not intersect any area of any such waters in such a manner that the maintenance of aquatic life in the body of water as a whole would be adversely affected, nor shall any mixing zone contain more than 25% of the cross-sectional area or volume of flow of a stream except for those streams where the dilution ratio is less than 3:1. All water quality standards of this Part must be met at every point outside of the area and volume of the receiving water within which mixing is allowed. The acute toxicity standards of Sections 302.208 and 302.210 must be met within the area and volume within which mixing is allowed, except as provided in subsection (e).
- d) Pursuant to the procedures of Section 39 of the Act and 35 Ill. Adm. Code 309, a person may apply to the Agency to include as a condition in an NPDES permit formal definition of the area and volume of the waters of the State within which mixing is allowed for the NPDES discharge in question. Such formally defined area and volume of allowed mixing shall constitute a "mixing zone" for the purposes of 35 Ill. Adm. Code: Subtitle C. Upon proof by the applicant that a proposed mixing zone conforms with the requirements of Section 39 of the Act, this Section and any additional limitations as may be imposed by the Clean Water Act (CWA) (33 U.S.C 1251 et seq.), the Act or Board regulations, the Agency shall, pursuant to Section 39(b) of the Act, include within the NPDES permit a condition defining the mixing zone.
- e) Pursuant to the procedures of Section 39 of the Act and 35 Ill. Adm. Code 309, a person may apply to the Agency

to include as a condition in an NPDES permit a ZID as a component portion of a mixing zone. Such ZID shall, at a minimum, be limited to waters within which effluent dispersion is immediate and rapid. For the purposes of this subsection, "immediate" dispersion means an effluent's merging with receiving waters without delay in time after its discharge and within close proximity of the end of the discharge pipe, and "rapid" dispersion means an effluent's quick merging with receiving waters so as to minimize the length of exposure time of aquatic life to undiluted effluent. Upon proof by the applicant that a proposed ZID conforms with the requirements of Section 39 of the Act and this Section, the Agency shall, pursuant to Section 39(b) of the Act, include within the NPDES permit a condition defining the ZID.

- f) Pursuant to Section 39 of the Act and 35 Ill. Adm. Code 309.103, an applicant for an NPDES permit shall submit data to allow the Agency to determine that the nature of any mixing zone or mixing zone in combination with a ZID conforms with the requirements of Section 39 of the Act and of this Section. A permittee may appeal Agency determinations concerning a mixing zone or ZID pursuant to the procedures of Section 40 of the Act and 35 Ill. Adm. Code 309.181.
- g) Where a mixing zone is defined in an NPDES permit, the waters within that mixing zone, for the duration of that NPDES permit, shall constitute the sole waters within which mixing is allowed for the permitted discharge. It shall not be a defense in any action brought pursuant to 35 Ill. Adm. Code 304.105 that the area and volume of waters within which mixing may be allowed pursuant to subsection (b) is less restrictive than the area or volume or waters encompassed in the mixing zone.
- h) Where a mixing zone is explicitly denied in a NPDES permit, no waters may be used for mixing by the discharge to which the NPDES permit applies, all other provisions of this Section notwithstanding.
- i) Where an NPDES permit is silent on the matter of a mixing zone, or where no NPDES permit is in effect, the burden of proof shall be on the discharger to demonstrate compliance with this Section in any action brought pursuant to 35 Ill. Adm. Code 304.105.

(Source: Amended at _____ Ill. Reg. _____,
effective _____)

Section 302.103 Stream Flows

Except as otherwise provided in this Chapter with respect to **temperature**, the water quality standards in this Part shall apply

at all times except during periods when flows are less than the average minimum seven day low flow which occurs once in ten years.

(Source: Amended at _____ Ill. Reg. _____, effective _____)

SUBPART B: GENERAL USE WATER QUALITY STANDARDS

Section 302.203 Unnatural Sludge Offensive Conditions

Waters of the State shall be free from unnatural sludge or bottom deposits, floating debris, visible oil, odor, unnatural plant or algal growth, unnatural color or turbidity of other than natural origin. For matter of other than natural origin in concentrations or combinations toxic or harmful to human, plant or aquatic life. The allowed mixing provisions of Section 302.102 shall not be used to comply with the provisions of this Section.

(Source: Amended at _____ Ill. Reg. _____, effective _____)

Section 302.208 Numeric Standards for Chemical Constituents

The following levels of chemical constituents shall not be exceeded:

CONSTITUENT	STORED NUMBER	CONCENTRATION (mg/l)
Arsenic (total)	01002	1.0
Barium (total)	01007	5.0
Boron (total)	01022	1.0
Cadmium (total)	01027	0.05
Chloride	00940	500.
Chromium (total hexavalent)	01032	0.05
Chromium (total trivalent)	01033	1.0
Copper (total)	01042	0.02
Cyanide	00720	0.025
Fluoride	00951	1.4
Iron (total)	01045	1.0
Lead (total)	01051	0.1
Manganese (total)	01055	1.0
Mercury (total)	71900	0.0005
Nickel (total)	01067	1.0
Phenols	32730	0.1
Selenium (total)	01147	1.0
Silver (total)	01077	0.005
Sulfate	00945	500.
Total Dissolved Solids	70300	1000.
Zinc	01092	1.0

a) The acute standard (AS) for the chemical constituents listed in subsection (d) shall not be exceeded at any

time except as provided in subsection (c).

b) The chronic standard (CS) for the chemical constituents listed in subsection (d) shall not be exceeded by the arithmetic average of at least four consecutive samples collected over any period of at least four days, except as provided in subsection (c). The samples used to demonstrate compliance or lack of compliance with a CS must be collected in a manner which assures an average representative of the sampling period.

c) 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 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.

d)

<u>Constituent</u>	<u>STORET Number</u>	<u>AS (ug/l)</u>	<u>CS (ug/l)</u>
<u>Arsenic (total)</u>	<u>01002</u>	<u>360</u>	<u>190</u>
<u>Cadmium (total)</u>	<u>01027</u>	<u>exp[A + Bln(H)], but not to exceed 50 ug/l, where A = -2.918 and B = 1.128</u>	<u>exp[A + Bln(H)], where A = -3.490 and B = 0.7852</u>
<u>Chromium (total hexavalent)</u>	<u>01032</u>	<u>16</u>	<u>11</u>
<u>Chromium (total trivalent)</u>	<u>01033</u>	<u>exp[A + Bln(H)], where A = 3.688 and B = 0.8190</u>	<u>exp[A + Bln(H)], where A = 1.561 and B = 0.8190</u>
<u>Copper (total)</u>	<u>01042</u>	<u>exp[A + Bln(H)], where A = -1.464 and B = 0.9422</u>	<u>exp[A + Bln(H)], where A = -1.465 and B = 0.8545</u>
<u>Cyanide</u>	<u>00718</u>	<u>22</u>	<u>5.2</u>
<u>Lead (total)</u>	<u>01051</u>	<u>exp[A + Bln(H)], but not to exceed 100 ug/l, where A = -1.460 and</u>	<u>Not Applied</u>

B = 1.273

<u>Mercury</u>	<u>71900</u>	<u>0.5</u>	<u>Not Applied</u>
<u>TRC</u>	<u>50060</u>	<u>19</u>	<u>11</u>

where: ug/l = microgram per liter

exp[x] = base of natural logarithms
raised to the x-power

ln(H) = natural logarithm of Hardness
(STORET 00900)

e) Concentrations of the following chemical constituents shall not be exceeded except in waters for which mixing is allowed pursuant to Section 302.102.

<u>Constituent</u>	<u>Units</u>	<u>STORET Number</u>	<u>Standard</u>
<u>Barium (total)</u>	<u>mg/L</u>	<u>01007</u>	<u>5.0</u>
<u>Boron (total)</u>	<u>mg/L</u>	<u>01022</u>	<u>1.0</u>
<u>Chloride (total)</u>	<u>mg/L</u>	<u>00940</u>	<u>500.</u>
<u>Fluoride</u>	<u>mg/L</u>	<u>00951</u>	<u>1.4</u>
<u>Manganese (total)</u>	<u>mg/L</u>	<u>01055</u>	<u>1.0</u>
<u>Nickel (total)</u>	<u>mg/L</u>	<u>01067</u>	<u>1.0</u>
<u>Phenols</u>	<u>mg/L</u>	<u>32730</u>	<u>0.1</u>
<u>Selenium (total)</u>	<u>mg/L</u>	<u>01147</u>	<u>1.0</u>
<u>Silver (total)</u>	<u>ug/L</u>	<u>01077</u>	<u>5.0</u>
<u>Sulfate</u>	<u>mg/L</u>	<u>00945</u>	<u>500.</u>
<u>Total Dissolved Solids</u>	<u>mg/L</u>	<u>70300</u>	<u>1000.</u>
<u>Zinc (total)</u>	<u>mg/L</u>	<u>01092</u>	<u>1.0</u>

where: mg/L = milligram per liter

ug/L = microgram per liter

(Source: Amended at _____ Ill. Reg. _____,
effective _____)

Section 302.210 Substances Toxic to Aquatic Life Other Toxic
Substances

Any substance toxic to aquatic life shall not exceed one-tenth of the 96-hour median tolerance limit (96-hr. TLM) for native fish or essential fish food organisms, except for

Waters of the State shall be free from any substances or

combination of substances in concentrations toxic or harmful to human health, or to animal, plant or aquatic life. Individual chemical substances or parameters for which numeric standards are specified in this Subpart are not subject to this Section.

- a) Any substance or combination of substances shall be deemed to be toxic or harmful to aquatic life if present in concentrations that exceed the following:
 - 1) An Acute Aquatic Toxicity Criterion (AATC) validly derived and correctly applied pursuant to procedures set forth in Sections 302.612 through 302.618 or in Section 302.621; or
 - 2) A Chronic Aquatic Toxicity Criterion (CATC) validly derived and correctly applied pursuant to procedures set forth in Sections 302.627 or 302.630

- b) Any substance or combination of substances shall be deemed to be toxic or harmful to wild or domestic animal life if present in concentrations that exceed any Wild and Domestic Animal Protection Criterion (WDAPC) validly derived and correctly applied pursuant to Section 302.633.

- c) Any substance or combination of substances shall be deemed to be toxic or harmful to human health if present in concentrations that exceed criteria, validly derived and correctly applied, based on either of the following:
 - 1) Disease or functional impairment due to a physiological mechanism for which there is a threshold dose below which no damage occurs calculated pursuant to Sections 302.642 through 302.648 (Human Threshold Criterion); or
 - 2) Disease or functional impairment due to a physiological mechanism for which any dose may cause some risk of damage calculated pursuant to Sections 302.651 through 302.658 (Human Nonthreshold Criterion).

- d) The most stringent criterion of subsections (a), (b), and (c) shall apply at all points outside of any waters within which mixing is allowed pursuant to Section 302.102. In addition, the AATC derived pursuant to subsection (a)(1) shall apply in all waters except that it shall not apply within a ZID that is prescribed in accordance with Section 302.102.

- e) The procedures of Subpart F set forth minimum data requirements, appropriate test protocols and data assessment methods for establishing criteria pursuant to

subsections (a), (b), and (c). No other procedures may be used to establish such criteria unless approved by the Board in a rulemaking or adjusted standards proceeding pursuant to Title VII of the Act. The validity and applicability of the Subpart F procedures may not be challenged in any proceeding brought pursuant to Titles VIII or X of the Act, although the validity and correctness of application of the numeric criteria derived pursuant to Subpart F may be challenged in such proceedings pursuant to subsection (f).

- f) 1) A permittee may challenge the validity and correctness of application of a criterion derived by the Agency pursuant to this Section only at the time such criterion is first applied in an NPDES permit pursuant to 35 Ill. Adm. Code 309.152 or in an action pursuant to Title VII of the Act for violation of the toxicity water quality standard. Failure of a person to challenge the validity of a criterion at the time of its first application shall constitute a waiver of such challenge in any subsequent proceeding involving application of the criterion to that person.
- 2) Consistent with subsection (f)(1), if a criterion is included as, or is used to derive, a condition of an NPDES discharge permit, a permittee may challenge the criterion in a permit appeal pursuant to Section 40 of the Act and 35 Ill. Adm. Code 309.181. In any such action, the Agency shall include in the record all information upon which it has relied in developing and applying the criterion, whether such information was developed by the Agency or submitted by the Petitioner. THE BURDEN OF PROOF SHALL BE ON THE PETITIONER TO DEMONSTRATE THAT THE CRITERION-BASED CONDITION IS NOT NECESSARY TO ACCOMPLISH THE PURPOSES OF SUBSECTION (a) (Section 40(a)(1) of the Act), but there is no presumption in favor of the general validity and correctness of the application of the criterion as reflected in the challenged condition.
- 3) Consistent with subsection (f)(1), in an action where alleged violation of the toxicity water quality standard is based on alleged excursion of a criterion, the person bringing such action shall have the burdens of going forward with proof and of persuasion regarding the general validity and correctness of application of the criterion.
- g) Subsections (a) through (e) do not apply to USEPA registered pesticides approved for aquatic application and applied pursuant to the following conditions:

- a₁) Application shall be made in strict accordance with label directions;
- b₂) Applicator shall be properly certified under the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 135 et seq. (1972));
- e₃) Applications of aquatic pesticides must be in accordance with the laws, regulations and guidelines of all State and federal agencies authorized by law to regulate, use or supervise pesticide applications, among which ~~are~~ is included the Illinois Department of Agriculture and the Illinois Department of Public Health pursuant to Ill. Rev. Stat. 1979 ch. 57 pars. 256 through 267, and the Department of Energy and Natural Resources pursuant to Section 3 of "AN ACT in relation to natural resources, research, data collection and environmental studies", Ill. Rev. Stat. 1979~~87~~ ch. 96 1/2, par. 7403.
- d₄) No aquatic pesticide shall be applied to waters affecting public or food processing water supplies unless a permit to apply the pesticide has been obtained from the Agency. All permits shall be issued so as not to cause a violation of the Act or of any of the Board's rules or regulations. To aid applicators in determining their responsibilities under this subsection, a list of waters affecting public water supplies will be published and maintained by the Agency's Division of Public Water Supplies.

(Source: Amended at _____ Ill. Reg. _____,
effective _____)

SUBPART F: PROCEDURES FOR DETERMINING
WATER QUALITY CRITERIA

Section 302.601 Scope and Applicability

This Subpart contains the procedures for determining the water quality criteria set forth in Section 302.210(a), (b) and (c).

(Source: Added at _____ Ill. Reg. _____,
effective _____)

Section 302.603 Definitions

As used in this Subpart, the following terms shall have the meanings specified.

"Bioconcentration" means an increase in concentration of a chemical and its metabolites in an organism (or specified tissues thereof) relative to the concentration of the chemical in the ambient water acquired through contact with the water alone.

"Carcinogen" means a chemical which causes an increased incidence of benign or malignant neoplasms, or a statistically significant decrease in latency period between exposure and onset of neoplasms in at least one mammalian species or man through epidemiological or clinical studies.

"EC-50" means the concentration of a substance or effluent which causes a given effect to 50% of the exposed organisms in a given time period.

"LC-50" means the concentration of a toxic substance or effluent which is lethal to 50% of the exposed organisms in a given time period.

"LOAEL" or "Lowest Observable Adverse Effect Level" means the lowest tested concentration of a chemical or substance which produces a statistically significant increase in frequency or severity of non-overt adverse effects between the exposed population and its appropriate control.

"MATC" or "Maximum Acceptable Toxicant Concentration" means the value obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration which did not cause the occurrence of a specified adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specified adverse effect and above which all tested concentrations caused such an occurrence.

"NOAEL" or "No Observable Adverse Effect Level" means the highest tested concentration of a chemical or substance which does not produce a statistically significant increase in frequency or severity of non-overt adverse effects between the exposed population and its appropriate control.

"Resident or Indigenous Species" means species which currently live a substantial portion of their lifecycle or reproduce in a given body of water, or which are native species whose historical range includes a given body of water.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.604 Mathematical Abbreviations

The following mathematical abbreviations have been used in this Subpart:

<u>exp x</u>	<u>base of the natural logarithm, e, raised to x-power</u>
<u>ln x</u>	<u>natural logarithm of x</u>
<u>log x</u>	<u>logarithm to the base 10 of x</u>
<u>A**B</u>	<u>A raised to the B-power</u>
<u>SUM(x)</u>	<u>summation of the values of x</u>

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.606 Data Requirements

The Agency shall review, for validity, applicability and completeness, data used in calculating criteria. To the extent available, and to the extent not otherwise specified, testing procedures, selection of test species and other aspects of data acquisition must be according to methods published by USEPA or nationally recognized standards organizations, including but not limited to those methods found in "Standard Methods", incorporated by reference in 35 Ill. Adm. Code 301.106, or approved by the American Society for Testing and Materials as incorporated by reference in 35 Ill. Adm. Code 301.106.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.612 Determining the Acute Aquatic Toxicity Criterion for an Individual Substance - General Procedures

- a) A chemical specific Acute Aquatic Toxicity Criterion (AATC) is calculated using procedures specified in

Sections 302.615 and 302.681 if acute toxicity data are available for at least five (5) resident or indigenous species from five (5) different North American genera of freshwater organisms including representatives of the following taxa:

- 1) Representatives of two families in the Class Osteichthyes (Bony Fishes).
 - 2) The family Daphnidae.
 - 3) A benthic aquatic macroinvertebrate.
 - 4) A vascular aquatic plant or a third family in the Phylum Chordata which may be from the Class Osteichthyes.
- b) If data are not available for resident or indigenous species, data for non-resident species may be used if the non-resident species is of the same family or genus and has a similar habitat and environmental tolerance. The procedures of Section 302.615 must be used to obtain an AATC for individual substances whose toxicity is unaffected by ambient water quality characteristics. The procedures of Section 302.618 must be used if the toxicity of a substance is dependent upon some other water quality characteristic.
- c) If data are not available that meet the requirements of subsection (a), an AATC is calculated by obtaining at least one EC-50 or LC-50 value from both a daphnid species and either fathead minnow or bluegill. If there are data available for any other North American freshwater species, they must also be included. An AATC is calculated by dividing the lowest Species Mean Acute Value (SMAV), as determined according to Section 302.615, by 10.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.615 Determining the Acute Aquatic Toxicity Criterion - Toxicity Independent of Water Chemistry

If the acute toxicity of the chemical has not been shown to be related to a water quality characteristic, including but not limited to, hardness, pH, temperature, etc., the AATC is calculated by using the procedures below.

- a) For each species for which more than one acute value is available, the Species Mean Acute Value (SMAV) is calculated as the geometric mean of the acute values from all tests.

- b) For each genus for which one or more SMAVs are available, the Genus Mean Acute Value (GMAV) is calculated as the geometric mean of the SMAVs available for the genus.
- c) The GMAVs are ordered from high to low.
- d) Ranks (R) are assigned to the GMAVs from "1" for the lowest to "N" for the highest. If two or more GMAVs are identical, successive ranks are arbitrarily assigned.
- e) The cumulative probability, P, is calculated for each GMAV as R/(N + 1).
- f) The GMAVs to be used in the calculations of subsection (g) must be those with cumulative probabilities closest to 0.05. If there are less than 59 GMAVs in the total data set, the values utilized must be the lowest obtained through the ranking procedures of subsections (c) and (d). "T" is the number of GMAV's which are to be used in the calculations of subsection (g). T is equal to 4 when the data set includes at least one representative from each of the five taxa in Section 302.612 and a representative from each of the three taxa listed below. T is equal to 3 when the data includes at least one representative from each of the five taxa in Section 302.612 and from one or two of the taxa listed below. T is equal to 2 when the data set meets the minimum requirements of Section 302.612 but does not include representatives from any of the three taxa listed below. When toxicity data on any of the three taxa listed below are available, they must be used along with the minimum data required pursuant to Section 302.612.
- 1) A benthic crustacean, unless such was used pursuant to Section 302.612(a)(3), in which case an insect must be utilized.
 - 2) A member of a phylum not used in subsections (a), (b) or f(1).
 - 3) An insect from an order not already represented.
- g) Using the GMAVs and T-value identified pursuant to subsection (f) and the Ps calculated pursuant to subsection (e), the Final Acute Value (FAV) and the AATC are calculated as:

$$S^{**2} = \frac{[\text{SUM}(\ln \text{GMAV})^{**2}] - ((\text{SUM}(\ln \text{GMAV}))^{**2})/T}{[\text{SUM}(P) - ((\text{SUM}(P^{**0.5}))^{**2})/T]}$$

$$L = \frac{[\text{SUM}(\ln \text{GMAV}) - S(\text{SUM}(P^{**0.5}))]}{T}$$

$$A = L + 0.2236 S$$

$$FAV = \exp(A)$$

$$AATC = FAV/10$$

- n) If a resident or indigenous species necessary to maintain the commercial, recreational or ecological integrity of the waterbody will not be protected by the calculated FAV, then the LC-50 or LC-50 for that species is used as the FAV.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.618 Determining the Acute Aquatic Toxicity Criterion Toxicity Dependent on Water Chemistry

If data are available to show that a relationship exists between a water quality characteristic (WQC) and acute toxicity to two or more species, an AATC can be calculated. The best documented relationship is that between the water quality characteristic, hardness and acute toxicity of metals. Although this relationship between hardness and acute toxicity is typically non-linear, it can be linearized by a logarithmic transformation (i.e. for any variable, K, $f(K) = \text{logarithm of } K$) of the variables and plotting the logarithm of hardness against the logarithm of acute toxicity. Similarly, relationships between acute toxicity and other water quality characteristics, such as pH or temperature, may require a transformation, including no transformation (i.e. for any variable, K, $f(K) = K$) for one or both variables to obtain least squares linear regression of the transformed acute toxicity values on the transformed values of the water quality characteristic. An AATC is calculated using the following procedures.

- a) For each species for which acute toxicity values are available at two or more different values of the water quality characteristic, a linear least squares regression of the transformed acute toxicity (TAT) values on the transformed water quality characteristic (TWQC) values is performed to obtain the slope of the line describing the relationship.
- b) Each of the slopes determined pursuant to subsection (a) is evaluated as to whether or not it is statistically valid, taking into account the range and number of tested values of the water quality characteristic and the degree of agreement within and between species. If slopes are not available for at least one fish and one invertebrate species, or if the available slopes are too dissimilar, or if too few data are available to define

the relationship between acute toxicity and the water quality characteristic, then the AATC must be calculated using the procedures in Section 302.615.

- c) Normalize the TAT values for each species by subtracting W, the arithmetic mean of the TAT values of a species from each of the TAT values used in the determination of the mean, such that the arithmetic mean of the normalized TAT values for each species individually or for any combination of species is zero (0.0).
- d) Normalize the TWQC values for each species using X, the arithmetic mean of the TWQC values of a species, in the same manner as in subsection (c)
- e) Group all the normalized data by treating them as if they were from a single species and perform a least squares linear regression of all the normalized TAT values on the corresponding normalized TWQC values to obtain the pooled acute slope, V.
- f) For each species, the graphical intercept representing the species TAT intercept, f(Y), at a specific selected value, Z, of the WQC is calculated using the equation:

$$\underline{f(Y) = W - V(X - g(Z))}$$

Where:

f() is the transformation used to convert acute toxicity values to TAT values;

Y is the species acute toxicity intercept or species acute intercept;

W is the arithmetic mean of the TAT values as specified in subsection (c);

V is the pooled acute slope as specified in subsection (e);

X is the arithmetic mean of the TWQC values as specified in subsection (d);

g() is the transformation used to convert the WQC values to TWQC values; and

Z is a selected value of the WQC.

- g) For each species, determine the species acute intercept, Y, by carrying out an inverse transformation of the species TAT value, f(Y). For example, in the case of a logarithmic transformation, Y = antilogarithm of (f(Y)); or in the case where no transformation is used, Y =

f(Y).

- h) The Final Acute Intercept (FAI) is derived by using the species acute intercepts, obtained from subsection (g), in accordance with the procedures described in Section 302.615(b) through (g), with the word "value" replaced by the word "intercept". Note that in this procedure geometric means and natural logarithms are always used.
- i) The Aquatic Acute Intercept (AAI) is obtained by dividing the FAI by two.
- j) The AATC at any value of the WQC, denoted by WQCx, is calculated using the terms defined in subsection (f) and the equation:

$$\text{AATC} = \exp[V(g(\text{WQCx}) - g(Z)) + f(\text{AAI})].$$

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.621 Determining the Acute Aquatic Toxicity Criterion - Procedure for Combinations of Substances

An AATC for any combination of substances (including effluent mixtures) must be determined by the following toxicity testing procedures:

- a) Not more than 50% of test organisms from the most sensitive species tested may exhibit mortality or immobility after a 48-hour test for invertebrate or a 96-hour test for fishes.
- b) Three resident or indigenous species of ecologically diverse taxa must be tested initially. If resident or indigenous species are not available for testing, non-resident species may be used if the non-resident species is of the same family or genus and has a similar habitat and environmental tolerance.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.627 Determining the Chronic Aquatic Toxicity Criterion for an Individual Substance - General Procedures

- a) A chemical-specific Chronic Aquatic Toxicity Criterion (CAATC) is calculated using procedures specified in subsections (b) and (c) when chronic toxicity data are available for at least five species from five different North American genera of freshwater organisms, including representatives from the following taxa:

- 1) Representatives of two families in the Class Osteichthyes (Bony Fishes).
 - 2) The family Daphnidae.
 - 3) A benthic aquatic macroinvertebrate.
 - 4) An alga (96-hour test) or a vascular aquatic plant.
- b) A CATC is derived in the same manner as the FAV in Sections 302.615 or 302.618 by substituting CATC for FAV or FAL, chronic for acute, MATC for LC-50, SMCV (Species Mean Chronic Value) for SMAV, and GMCV (Genus Mean Chronic Value) for GMAV.
- c) If data are not available to meet the requirements of subsection (a), a CATC is calculated by dividing the FAV by the highest acute-chronic ratio obtained from at least one fish and one invertebrate species. The acute-chronic ratio for a species equals the acute toxicity concentration from data considered under Sections 302.612 through 302.618, divided by the chronic toxicity concentration from data calculated under Section 302.627 subject to the following conditions.
- 1) If the toxicity of a substance is related to any water quality parameter, the acute-chronic ratio must be based on acute and chronic toxicity data obtained from organisms exposed to test water with similar, if not identical, values of those water quality parameters. Preference under this subsection must be given to data from acute and chronic tests done by the same author or in the same reference in order to increase the likelihood of comparable test conditions.
 - 2) If the toxicity of a substance is unrelated to water quality parameters, the acute-chronic ratio may be derived from any acute and chronic test on a species regardless of the similarity in values of those water quality parameters. Preference under this subsection must be given to data from acute and chronic tests done on the same organisms or their descendants.
 - 3) If there is more than one acute-chronic ratio for a species, a geometric mean of the ratio is calculated, corrected for the relationship of toxicity to water quality parameters.
 - 4) If the acute and chronic toxicity data indicate that the acute-chronic ratio varies with changes in water quality parameters, the acute-chronic ratio

used over specified values of the water quality parameters must be based on the ratios at water quality parameter values closest to those specified.

- d) If acute-chronic ratios are unavailable for at least two North American freshwater species, the CATC must be calculated by dividing the FAV by a factor of 25.
- e) If a resident or indigenous species necessary to maintain the commercial, recreational or ecological integrity of the water body will not be protected by the calculated CATC, then the MATC for that species is used as the CATC.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.630 Determining the Chronic Aquatic Toxicity Criterion - Procedure for Combinations of Substance

A CATC for any combination of substances (including effluent mixtures) may be determined by toxicity testing procedures pursuant to the following:

- a) No combination of substances may exceed concentrations greater than a NOAEL as determined for the most sensitive of the species tested.
- b) Three resident or indigenous species of ecologically diverse taxa must be tested initially. If resident or indigenous species are not available for testing, non-resident species may be used if the non-resident species is of the same family or genus and has a similar habitat and environmental tolerance.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.633 The Wild and Domestic Animal Protection Criterion

The Wild and Domestic Animal Protection Criterion (WDAPC) is the concentration of a substance which if not exceeded protects Illinois wild and domestic animals from adverse effects, such as functional impairment or pathological lesions, resulting from ingestion of surface waters of the State and from ingestion of aquatic organisms taken from surface waters of the State.

- a) For those substances for which a NOAEL has been derived from studies of mammalian or avian species exposed to the substance via oral routes including gavage, the lowest NOAEL among species must be used in calculating

the WDAPC. Additional considerations in selecting NOAEL include:

- 1) If the NOAEL is given in milligrams of toxicant per liter of water consumed (mg/L), prior to calculating the WDAPC, the NOAEL must be multiplied by the daily average volume of water consumed by the test animals in liters per day (L/d), and divided by the average weight of the test animals in kilograms (kg).
 - 2) If the NOAEL is given in milligrams of toxicant per kilogram of food consumed (mg/kg), prior to calculating the WDAPC, the NOAEL must be multiplied by the average amount of food in kilograms consumed daily by the test animals (kg/d) and divided by the average weight of the test animals in kilograms (kg).
 - 3) If the animals used in a study were not exposed to the toxicant each day of the test period, the NOAEL must be multiplied by the ratio of days of exposure to the total days in the test period.
 - 4) If more than one NOAEL is available for the same animal species, the geometric mean of the NOAELs must be used to calculate the WDAPC.
- b) For those substances for which a NOAEL is not available but the lowest observed adverse effect level (LOAEL) has been derived from studies of animal species exposed to the substance via oral routes including gavage, one-tenth of the LOAEL may be substituted for the NOAEL.
- c) The LOAEL must be selected in the same manner as that specified for the NOAEL in subsection (a).
- d) The WDAPC, measured in milligrams per liter (mg/L), is calculated according to the equation:

$$\text{WDAPC} = \{0.1 \text{ NOAEL} \times \text{Wt}\} / \{W + (F \times \text{BCF})\}$$

Where:

NOAEL is derived from mammalian or avian studies as specified in subsection (a) and (b), and is measured in units of milligrams of substance per kilogram of body weight per day (mg/kg-d).

Wt = Average weight in kilograms (kg) of the test animals.

W = Average daily volume of water in liters

consumed per day (L/d) by the test animals.

F = Average daily amount of food consumed by the test animals in kilograms (kg/d).

BCF = Aquatic life Bioconcentration Factor with units of liter per kilogram (L/kg), as derived in Sections 302.660 through 302.666.

The 0.1 represents an uncertain factor to account for species variability.

- e) If no studies pertaining to the toxic substance in question can be found by the Agency, no criterion can be determined.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.642 The Human Threshold Criterion

The Human Threshold Criterion (HTC) of a substance is that concentration or level of a substance at which humans are protected from adverse effects resulting from incidental exposure to, or ingestion of, surface waters of the State and from ingestion of aquatic organisms taken from surface waters of the State. HTCs are derived for those toxic substances for which there exists a threshold dosage or concentration below which no adverse effect or response is likely to occur.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.645 Determining the Acceptable Daily Intake

The Acceptable Daily Intake (ADI) is the maximum amount of a substance which, if ingested daily for a lifetime, results in no adverse effects to humans. Subsections (a) through (e) list, in the order of preference, methods for determining the acceptable daily intake.

- a) The lowest of the following ADI values:
- 1) For those substances which are listed with a maximum contaminant level in 40 CFR 141, incorporated by reference in 35 Ill. Adm. Code 301.106, or in 35 Ill. Adm. Code 611, the ADI equals the product of multiplying the maximum contaminant level given in milligrams per liter (mg/L) by 2 liters per day (L/d).
 - 2) For those substances which are listed with a maximum allowable concentration standard in 35 Ill. Adm. Code: Subtitle F, the acceptable daily intake

equals the product of multiplying the public health enforcement standard given in milligrams per liter (mg/L) by 2 liters per day (L/d)

- b) For those substances for which a no observed adverse effect level (NOAEL-H) for humans exposed to the substance in drinking water has been derived, the acceptable daily intake equals the product of multiplying one-tenth of the NOAEL-H given in milligrams of toxicant per liter of water consumed (mg/L), by 2 liters per day (L/d). The lowest NOAEL-H must be used in the calculation of the acceptable daily intake.
- c) For those substances for which the lowest observed adverse effect level (LOAEL-H) for humans exposed to the substance in drinking water has been derived, one-hundredth of the LOAEL-H may be substituted for the NOAEL-H in subsection (b).
- d) For those substances for which a no observed adverse effect level (NOAEL-A) has been derived from studies of mammalian test species exposed to the substance via oral routes including gavage, the acceptable daily intake equals the product of multiplying 1/100 of the NOAEL-A given in milligrams toxicant per day per kilogram of test species weight (mg/kg-d) by the average weight of an adult human of 70 kilograms (kg). The lowest NOAEL-A among animal species must be used in the calculation of the acceptable daily intake. Additional considerations in selecting the NOAEL-A include:
- 1) If the NOAEL-A is given in milligrams of toxicant per liter of water consumed (mg/L) then, prior to calculating the acceptable daily intake, the NOAEL-A must be multiplied by the daily average volume of water consumed by the mammalian test species in liters per day (L/d) and divided by the average weight of the mammalian test species in kilograms (kg).
 - 2) If the NOAEL-A is given in milligrams of toxicant per kilogram of food consumed (mg/kg), prior to calculating the acceptable daily intake the NOAEL-A must be multiplied by the average amount in kilograms of food consumed daily by the mammalian test species (kg/d) and divided by the average weight of the mammalian test species in kilograms (kg).
 - 3) If the mammalian test species were not exposed to the toxicant each day of the test period, the NOAEL-A must be multiplied by the ratio of days of exposure to the total days of the test period.

- 4) If more than one NOAEL-A is available for the same mammalian test species, the geometric mean of the NOAEL-As must be used.
- e) For those substances for which a NOAEL-A is not available but the lowest observed adverse effect level (LOAEL-A) has been derived from studies of mammalian test species exposed to the substance via oral routes including gavage, one-tenth of the LOAEL-A may be substituted for the NOAEL-A in subsection (d). The LOAEL-A must be selected in the same manner as that specified for the NOAEL-A in subsection (d).
- f) If no studies pertaining to the toxic substance in question can be found by the Agency, no criterion can be determined.

(Source: Added at _____ Ill. Reg. _____ effective _____)

Section 302.648 Determining the Human Threshold Criterion

The HTC is calculated according to the equation:

$$\text{HTC} = \text{ADI} / [W + (F \times \text{BCF})]$$

Where:

HTC = Human health protection criterion in milligrams per liter (mg/L).

ADI = Acceptable daily intake of substance in milligrams per day (mg/d) as specified in Section 302.645.

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 302.201(b)(3), or 0.001 liters per day (L/d) for other General Use waters.

F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d).

BCF = Aquatic organism Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in Sections 302.660 through 302.666.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.651 The Human Nonthreshold Criterion

The Human Nonthreshold Criterion (HNC) of a substance is that concentration or level of a substance at which humans are protected from an unreasonable risk of disease caused by a nonthreshold toxic mechanism as a result of incidental exposure to or ingestion of surface waters of the State and from ingestion of aquatic organisms taken from surface waters of the State. HNCs are derived for those toxic substances for which any exposure, regardless of extent, carries some risk of damage. Most substances regulated under this Section cause cancer (carcinogen) or mutations (mutagen). However, other deleterious effects may be identified in the future.

- a) For single substances, a risk level of one in one million (1 in 1,000,000) shall be allowed (i.e, considered acceptable) for the purposes of determination of an HNC.
- b) For mixtures of substances, an additive risk level of one in one hundred thousand (1 in 100,000) shall be allowed (i.e, considered acceptable) for the purposes of determination of an HNC.

(Source: Added at _____ Ill. Reg. _____,
effective _____)

Section 302.654 Determining the Risk Associated Intake

The Risk Associated Intake (RAI) is the maximum amount of a substance which if ingested daily for a lifetime is expected to result in the risk of one additional case of human cancer in a population of one million. Where more than one carcinogenic chemical is present, the RAI shall be based on an allowed additive risk of one additional case of cancer in a population of one hundred thousand. The RAI must be derived as specified in subsections (a) through (c).

- a) For those substances for which a human epidemiologic study has been performed, the RAI equals the product of the dose from exposure in units of milligrams toxicant per kilogram body weight per day (mg/kg-d) that results in a 70-year lifetime cancer probability of one in one million, times the average weight of an adult human of 70 kilograms (kg). The resulting RAI is expressed in milligrams toxicant per day (mg/d). If more than one human epidemiologic study is available, the lowest exposure level resulting in a 70-year lifetime probability of cancer equal to a ratio of one in one hundred thousand must be used in calculating the RAI.
- b) In the absence of an epidemiologic study, for those toxic substances for which a carcinogenic potency factor (CPF) has been derived from studies of mammalian test

species the risk associated intake is calculated from the equation:

$$\text{RAI} = \text{K/CPF}$$

Where.

RAI = Risk associated intake in milligrams per day (mg/d).

K = A constant consisting of the product of the average weight of an adult human, assumed to be 70 kg, and the allowed cancer risk level of one in one million (1/1,000,000).

CPF = Carcinogenic Potency Factor is the risk of one additional cancer per unit dose from exposure. The CPF is expressed in units of inverse milligrams per kilogram-day (1/mg/kg-d) as derived in subsections (b)(1) through (b)(7).

- 1) Only those studies which fulfill the data requirement criteria of Section 302.606 shall be used in calculating the CPF.
- 2) The linear non-threshold dose-response relationship developed in the same manner as in the USEPA document "Mutagenicity and Carcinogenicity Assessment of 1,3-butadiene", incorporated by reference in 35 Ill. Adm. Code 301.106, shall be used in obtaining the unit risk, defined as the 95th percentile upper bound risk of one additional cancer resulting from a life time exposure to a unit concentration of the substance being considered. The CPF shall be estimated from the unit risk in accordance with subsection (b)(7). In calculating a CPF, the Agency must review alternate scientifically valid protocols if so requested.
- 3) If in a study of a single species more than one type of tumor is induced by exposure to the toxic substance, the highest of the CPFs is used.
- 4) If two or more studies vary in either species, strain or sex of the test animal, or in tumor type, the highest CPF is used.
- 5) If more than one tumor of the same type is found in some of the test animals, these should be pooled so that the dose response relationship is dose versus number of tumors per animal. The potency estimate for this dose response relationship is used if it is higher than estimates resulting from other

methods.

- 6) If two or more studies are identical regarding species, strain and sex of the test animal, and tumor type, the highest of the CPFs is used.
 - 7) Calculation of an equivalent dose between animal species and humans using a surface area conversion, and conversion of units of exposure to dose in milligrams of toxicant per kilogram of body weight per day (mg/kg-d) must be performed as specified in the USEPA document "Mutagenicity and Carcinogenicity Assessment of 1,3-butadiene", incorporated by reference in 35 Ill. Adm. Code 301.106.
- c) If both a human epidemiologic study and a study of mammalian test species are available for use in subsections (a) and (b), the risk associated intake is determined as follows:
- 1) When the human epidemiologic study provides evidence of a carcinogenic effect on humans, the RAI is calculated from the human epidemiology study as specified in subsection (a).
 - 2) When the mammalian study provides evidence of a carcinogenic effect on humans, but the human epidemiologic study does not, a cancer risk to humans is assumed and the risk associated intake is calculated as specified in subsection (b).

(Source: Added at _____ Ill. Reg. _____,
effective _____)

Section 302.657 Determining the Human Nonthreshold Criterion

The HNC is calculated according to the equation:

$$\text{HNC} = \text{RAI} / [W + (F \times \text{BCF})]$$

Where:

HNC = Human Nonthreshold protection Criterion in milligrams per liter (mg/L).

RAI = Risk Associated Intake of substance in milligrams per day (mg/d) which is associated with a lifetime cancer risk level equal to a ratio of one to 1,000,000 as derived in Section 302.654.

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 302.201(b)(3), or 0.001 liters per day (L/d) for other General Use waters.

F = Assumed daily fish consumption in the United States equal to 0.020 kilograms per day (kg/d).

BCF = Aquatic life Bioconcentration Factor with units of liter per kilogram (L/kg) as derived in Section 302.663.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.658 Stream Flow for Application of Human Nonthreshold Criterion

The HNC shall apply at all times except during periods when flows are less than the harmonic mean flow, as determined by:

$$Q_{hm} = N / \sum(1/Q_i)$$

Where:

Q_{hm} = harmonic mean flow

N = number of daily values for stream flows

Q_i = daily streamflow value on day i.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.660 Bioconcentration Factor

A Bioconcentration Factor is used to relate substance residue in aquatic organisms to the concentration of the substance in the waters in which the organisms reside.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.663 Determination of Bioconcentration Factors

A Bioconcentration Factor equals the concentration of a substance in all or part of an aquatic organism in milligrams per kilogram of wet tissue weight (mg/kg), divided by the concentration of the substance in the water to which the organism is exposed in milligrams of the substance per liter of water (mg/l).

- a) The Bioconcentration Factor is calculated from a field study if the following conditions are met:

- 1) Data are available to show that the concentration of the substance in the water to which the organism was exposed remained constant over the range of territory inhabited by the organism and for a period of time exceeding 28 days;
 - 2) Competing mechanisms for removal of the substance from solution did not affect the bioavailability of the substance; and
 - 3) The concentration of the substance to which the organism was exposed is less than the lowest concentration causing any adverse effects on the organism.
- b) In the absence of a field-derived Bioconcentration Factor, the Bioconcentration Factor is calculated from a laboratory test if the following conditions are met:
- 1) The Bioconcentration Factor was calculated from measured concentrations of the toxic substance in the test solution;
 - 2) The laboratory test was of sufficient duration to have reached steady-state which is defined as a less than 10 percent change in the calculated Bioconcentration Factor over a 2-day period or 16 percent of the test duration whichever is longer. In the absence of a laboratory test which has reached steady-state, the Bioconcentration Factor may be calculated from a laboratory test with a duration greater than 28 days if more than one test is available for the same species of organism;
 - 3) The concentration of the toxic substance to which the test organism was exposed is less than the lowest concentration causing any adverse effects on the organism;
 - 4) If more than one Bioconcentration Factor for the same species is available, the geometric mean of the Bioconcentration Factors is used; and
 - 5) The Bioconcentration Factor is calculated on a wet tissue weight basis. A Bioconcentration Factor calculated using dry tissue weight may be converted to a wet tissue weight basis by multiplying the dry weight bioconcentration value by 0.1 for plankton and by 0.2 for individual species of fishes and invertebrates.
- c) In the absence of any Bioconcentration Factors measured from field studies as specified in subsection (a) or

laboratory studies which have reached steady-state as specified in subsection (b), the Bioconcentration Factor is calculated according to the equation:

$$\log BCF = A + B \log Kow$$

Where:

BCF = Bioconcentration Factor

Kow = The octanol/water partition coefficient measured as specified in ASTM E 1147, incorporated by reference in 35 Ill. Adm. Code 301.106. If the Kow is not available from laboratory testing, it may be calculated from structure-activity relationships or available regression equations.

The constants A = -0.23 and B = 0.76 shall be used unless a change in the value of the constants is requested. The Agency shall honor requests for changes only if such changes are accompanied by scientifically valid supporting data.

(Source: Added at _____ Ill. Reg. _____, effective _____)

Section 302.666 Utilizing the Bioconcentration Factor

The Bioconcentration Factor derived in Section 302.663 is used to calculate water quality criteria for a substance as specified below:

- a) When calculating a WDAPC as described in Section 302.633, the geometric mean of all available steady-state whole body Bioconcentration Factors for fish and shellfish species which constitutes or represents a portion of the diet of indigenous wild and domestic animal species is used. Additional considerations in deriving a Bioconcentration Factor include:
 - 1) An edible portion Bioconcentration Factor is converted to a whole body Bioconcentration Factor for a fish or shellfish species by multiplying the edible portion Bioconcentration Factor by the ratio of the percent lipid in the whole body to the percent lipid in the edible portion of the same species.
 - 2) A Bioconcentration Factor calculated as described in Section 302.663(c) is converted to a whole body Bioconcentration Factor by multiplying the

calculated Bioconcentration Factor by the ratio of the percent lipid in the whole body to 7.6.

b) When calculating either a human threshold criterion or a human nonthreshold criterion as described in Sections 302.642 through 302.648 and Sections 302.651 through 302.657, respectively, the geometric mean of all available edible portion Bioconcentration Factors for fish and shellfish species consumed by humans is used. Additional considerations in deriving a Bioconcentration Factor include:

1) Edible portions include:

A) Decapods -- muscle tissue.

B) Bivalve molluscs -- total living tissue.

C) Scaled fishes -- boneless, scaleless filets including skin except for bloater chubs in which the edible portion is the whole body excluding head, scales and viscera.

D) Smooth-skinned fishes -- boneless, skinless filets.

2) A whole body Bioconcentration Factor is converted to an edible portion Bioconcentration Factor by multiplying the whole body Bioconcentration Factor of a species by the ratio of the percent lipid in the edible portion to the percent lipid in the whole body of the same species.

3) A Bioconcentration Factor calculated as described in Section 302.663 is converted to an edible portion Bioconcentration Factor by multiplying the calculated Bioconcentration Factor by the ratio of the percent lipid in the edible portion to 7.6.

(Source: Added at _____ Ill. Reg. _____, effective _____)

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 shall be published when updated in the Illinois Register.

b) A criterion published pursuant to subsection (a) may be proposed to the Board for adoption as a numeric water quality standard.

c) The Agency shall maintain for inspection all information including, but not limited to, assumptions, toxicity data and calculations used in the derivation of any toxicity criterion listed pursuant to subsection (a) until adopted by the Board as a water quality standard.

(Source: Added at _____ Ill. Reg. _____,
effective _____)

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

PART 305
MONITORING AND REPORTING

Section
305.101 Preamble
305.102 Reporting Requirements
305.103 Effluent Measurement

APPENDIX A References to Previous Rules

AUTHORITY: Implementing Section 13 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1987, ch. 111 $\frac{1}{2}$, pars. 1013 and 1027).

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; codified at 6 Ill. Reg. 7818; amended at 8 Ill. Reg. 1600, effective January 18, 1984; amended in R88-1 at 13 Ill. Reg. 5989, effective April 18, 1989; amended in R88-21(A) at ____ Ill. Reg. _____, effective _____.

Section 305.102 Reporting Requirements

a) Every person within this State operating a pretreatment works, treatment works, or wastewater source shall submit operating reports to the Agency at a frequency to be determined by the Agency. "Agency" means the Illinois Environmental Protection Agency. Such reports shall contain information regarding the quantity of influent and of effluent discharged, of wastes bypassed and of combined sewer overflows; the concentrations of those physical, chemical, bacteriological and radiological parameters which shall be specified by the Agency; information concerning the biological impact of the discharge as specified by the Agency; and any additional information the Agency may reasonably require. This reporting requirement for pretreatment works shall only apply to those pretreatment works which: are required to have a pretreatment permit or authorization to discharge pursuant to 35 Ill. Adm. Code 310.

1) Discharge toxic pollutants, as defined in Section 502(f)(3) of the Clean Water Act, or pollutants which may interfere with the treatment process, into the receiving treatment works or are subject to regulations promulgated under Section 307 of the Clean Water Act (CWA); (33 U.S.C. 1251 et seq.); or

2) Discharge 15% or more of the total hydraulic flow

received by the treatment works, or

- 3) Discharge 15% or more of the total biological loading received by the treatment works as measured by 5-day biochemical oxygen demand.
- b) Every holder of an NPDES (National Pollutant Discharge Elimination System) permit is required to comply with the monitoring, sampling, recording and reporting requirements set forth in the permit and this Chapter.
- c) Compliance with the reporting requirements of 35 Ill. Adm. Code 310 satisfies this reporting requirement.

(Source: Amended at _____ Ill. Reg. _____,
effective _____)

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

PART 309
PERMITS

SUBPART A: NPDES PERMITS

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309.104	Renewal
309.105	Authority to Deny NPDES Permits
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309.108	Tentative Determination and Draft Permit
309.109	Public Notice
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309.149	Authority to Require Notice of Introduction of Pollutants into Publicly Owned Treatment Works
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309.151	Maintenance and Equipment
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309.266	Procedures
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APPENDIX A References to Previous Rules

AUTHORITY: Implementing Sections 13 and 13.3 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1987, ch. 111 $\frac{1}{2}$, pars. 1013, 1013.3 and 1027).

SOURCE: Adopted in R71-14, at 4 PCB 3, March 7, 1972; amended in R73-11, 12, at 14 PCB 661, December 5, 1974, at 16 PCB 511, April 24, 1975, and at 28 PCB 509, December 20, 1977; amended in R73-11, 12, at 29 PCB 477, at 2 Ill. Reg. 16, p. 20, effective April 20, 1978; amended in R79-13, at 39 PCB 263, at 4 Ill. Reg. 34, p. 159, effective August 7, 1980; amended in R77-12B, at 41 PCB 369, at 5 Ill. Reg. 6384, effective May 28, 1981; amended in R76-21, at 44 PCB 203, at 6 Ill. Reg. 563, effective December 24, 1981; codified 6 Ill. Reg. 7818; amended in R82-5, 10, at 54 PCB 411, at 8 Ill. Reg. 1612, effective January 18, 1984; amended in R86-44 at 12 Ill. Reg. 2495 effective January 13, 1988; amended in R88-1 at 13 Ill. Reg. 5993, effective April 18, 1989; amended in R88-21(A) at _____ Ill. Reg. _____, effective _____.

SUBPART A: NPDES PERMITS

Section 309.103 Application - General

a) Application Forms

- 1) An applicant for an National Pollution Discharge Elimination System (NPDES) Permit shall file an application, in accordance with Section 309.223 hereof, on forms provided by the Illinois Environmental Protection Agency (Agency). Such forms shall comprise the NPDES application forms promulgated by the U.S. Environmental Protection Agency for the type of discharge for which an NPDES Permit is being sought and such additional information as the Agency may reasonably require in order to determine that the discharge or proposed discharge will be in compliance with applicable state and federal requirements.
- 2) In addition to the above application forms, the Agency may require the submission of plans and specifications for treatment works and summaries of design criteria.
- 3) In addition to the above application forms, the Agency may require the installation, use, maintenance and reporting of results from monitoring equipment and methods, including biological monitoring. The Agency may require effluent toxicity testing to show compliance with 35 Ill. Adm. Code 302.621 and 302.630. If this toxicity testing shows the effluent to be toxic, the Agency may require further testing and identification of the toxicant(s) pursuant to 35 Ill. Adm. Code 302.210(a).

b) Animal Waste Facilities

An applicant for an NPDES Permit in connection with the operation of an animal waste facility shall complete, sign, and submit an NPDES application in accordance with the provisions of Part 35 Ill. Adm. Code 500 et seq.

c) Mining Activities

- 1) If, as defined by Section 35 Ill. Adm. Code 402.101, mining activities are to be carried out on a facility for which an NPDES Permit is held or required, the applicant must submit a permit application as required by Section 35 Ill. Adm. Code 403.103, 403.104 and 405.104. If the facility will have a discharge other than a mine discharge or non-point source mine discharge as defined by Section 35 Ill. Adm. Code 402.101, the applicant shall also submit an NPDES Permit application in accordance with Section 309.223 on forms supplied by the Agency.

- 2) As provided by Section 35 Ill. Adm. Code 403.101, except to the extent contradicted in 35 Ill. Adm. Code: Subtitle D, Chapter I, the rules contained in this Subpart A of 35 Ill. Adm. Code 309 apply to 35 Ill Adm. Code: Subtitle D, Chapter I NPDES Permits.
- 3) As provided by Section 35 Ill. Adm. Code 406.100, except to the extent provided in 35 Ill. Adm. Code: Subtitle D, Chapter I, the effluent and water quality standards of Parts 35 Ill. Adm. Code 302, 303 and 304 are inapplicable to mine discharges and non-point source mine discharges.

d) New Discharges

Any person whose discharge will begin after the effective date of this Subpart A or any person having an NPDES Permit issued by the U.S. Environmental Protection Agency for an existing discharge which will substantially change in nature, or increase in volume or frequency, must apply for an NPDES Permit either:

- 1) No later than 180 days in advance of the date on which such NPDES Permit will be required; or
- 2) In sufficient time prior to the anticipated commencement of the discharge to insure compliance with the requirements of Section 306 of the Clean Water Act (CWA) (33 U.S.C. 1251 et seq.), or with any applicable zoning or siting requirements established pursuant to Section 208(b)(2)(C) of the CWA, and any other applicable water quality standards and applicable effluent standards and limitations.

e) Signatures

An application submitted by a corporation shall be signed by a principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the application form originates. In the case of a partnership or a sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively. In the case of a publicly owned facility, the application shall be signed by either the principal executive officer, ranking elected official, or other duly authorized employee.


(Source: Amended at _____ Ill. Reg. _____,

effective _____.

IT IS SO ORDERED

Board Member J.D. Dumelle concurred.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Order was adopted on the 6th day of December, 1989, by a vote of 6-0



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board