**Section 302.504 Chemical Constituents**

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

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Constituent | Unit | AS | CS | HHS |
| Arsenic (Trivalent, dissolved) | µg/L |  | 148 x 1.0\*=148 | NA |
|  |  |  |  |  |
| Boron (total) | mg/L | 40.1 | 7.6 | NA |
|  |  |  |  |  |
| Cadmium (dissolved) | µg/L |  |  | NA |
| (0.041838)]}\* | (0.041838)]}\* |
|  |  |  |  |  |
|  |  | where *A* = -3.6867 and *B* = 1.128 | where *A* = -2.715 and *B* = 0.7852 |  |
|  |  |  |  |  |
| Chromium (Hexavalent, total) | µg/L | 16 | 11 | NA |
|  |  |  |  |  |
| Chromium (Trivalent, dissolved) | µg/L |  |  | NA |
| 0.316\* | 0.860\* |
|  |  | where *A* = 3.7256 and *B* = 0.819 | where *A* = 0.6848 and *B* = 0.819 |  |
|  |  |  |  |  |
| Copper (dissolved) | µg/L |  |  | NA |
| 0.960\* | 0.960\* |
|  |  |  |  |  |
|  |  | where *A* = -1.700 and *B* = 0.9422 | where *A* = -1.702 and *B* = 0.8545 |  |
|  |  |  |  |  |
| Cyanide\*\* | µg/L | 22 | 5.2 | NA |
|  |  |  |  |  |
| Fluoride (total) | µg/L | where *A* = 6.7319 and *B* = 0.5394 | , but must not exceed 4.0 mg/L | NA |
|  |  |
|  |  | where *A* = 6.0445 and *B* = 0.5394 |  |
|  |  |  |  |  |
| Lead (dissolved) | µg/L |  |  | NA |
| (0.145712)]}\* | (0.145712)]}\* |
|  |  |  |  |  |
|  |  | where *A* = -1.055 and *B* =1.273 | where A = -4.003 and B = 1.273 |  |
|  |  |  |  |  |
| Manganese (dissolved) | µg/L |  |  | NA |
|  |  |  |  |  |
|  |  | where *A* = 4.9187 and *B* = 0.7467 | where *A* = 4.0635 and *B* = 0.7467 |  |
|  |  |  |  |  |
| Nickel (dissolved) | µg/L |  |  | NA |
| 0.998\* | 0.997\* |
|  |  |  |  |  |
|  |  | where *A* = 2.255 and *B* = 0.846 | where *A* = 0.0584 and *B* = 0.846 |  |
|  |  |  |  |  |
| Selenium (dissolved) | µg/L | NA | 5.0 | NA |
|  |  |  |  |  |
| TRC | µg/L | 19 | 11 | NA |
|  |  |  |  |  |
| Zinc (dissolved) | µg/L |  |  | NA |
| 0.978\* | 0.986\* |
|  |  |  |  |  |
|  |  | where *A* = 0.884 and *B* = 0.8473 | where *A* = 0.884 and *B* = 0.8473 |  |
|  |  |  |  |  |
| Benzene | µg/L | 3900 | 800 | 310 |
|  |  |  |  |  |
| Chlorobenzene | mg/L | NA | NA | 3.2 |
|  |  |  |  |  |
| 2.4-Dimethylphenol | mg/L | NA | NA | 8.7 |
|  |  |  |  |  |
| 2,4-Dinitrophenol | mg/L | NA | NA | 2.8 |
|  |  |  |  |  |
| Endrin | µg/L | 0.086 | 0.036 | NA |
|  |  |  |  |  |
| Ethylbenzene | µg/L | 150 | 14 | NA |
|  |  |  |  |  |
| Hexachloroethane | µg/L | NA | NA | 6.7 |
|  |  |  |  |  |
| Methylene chloride | mg/L | NA | NA | 2.6 |
|  |  |  |  |  |
| Parathion | µg/L | 0.065 | 0.013 | NA |
|  |  |  |  |  |
| Pentachlorophenol | µg/L |  |   | NA |
|  |  |  |  |  |
|  |  | where *A* = -4.869 and *B* = 1.005 | where *A* = -5.134 and *B* = 1.005 |  |
|  |  |  |  |  |
| Toluene | µg/L  | 2000 | 610 | 51.0 |
|  |  |  |  |  |
| Trichloroethylene | µg/L | NA | NA | 370 |
|  |  |  |  |  |
| Xylene(s) | µg/L | 1200 | 490 | NA |

|  |
| --- |
| where: |
|  | NA | = | Not Applied |
|  | exp[x] | = | base of natural logarithms raised to the x-power |
|  | ln(H) | = | natural logarithm of hardness in mg/L as CaCO3 |
|  | \* | = | conversion factor multiplier for dissolved metals  |
|  | \*\* | = | standard to be evaluated using either of the following USEPA approved methods, incorporated by reference at 35 Ill. Adm. Code 301.106: Method OIA-1677, DW: Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry, January 2004, Document Number EPA-821-R-04-001; or Cyanide Amenable to Chlorination, Standard Methods 4500-CN-G (40 CFR 136.3). |

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

|  |  |  |  |
| --- | --- | --- | --- |
| Constituent |  | Unit | Water Quality Standard |
| Barium (total) | 01007 | mg/L | 5.0 |
| Chloride (total)  |  | mg/L | 500 |
| Iron (dissolved) |  | mg/L | 1.0 |
| Phenols |  | mg/L | 0.1 |
| Sulfate |  | mg/L | 500 |
| Total Dissolved Solids |  | mg/L | 1000 |

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

|  |  |  |
| --- | --- | --- |
| Constituent | Unit | Water Quality Standard |
| Arsenic (total) | µg/L | 50.0 |
| Boron (total) | mg/L | 1.0 |
| Barium (total) | mg/L | 1.0 |
| Chloride (total) | mg/L | 12.0 |
| Fluoride (total) | mg/L | 1.4 |
| Iron (dissolved) | mg/L | 0.30 |
| Lead (total) | µg/L | 50.0 |
| Manganese (total) | mg/L | 0.15 |
| Nitrate-Nitrogen | mg/L | 10.0 |
| Phosphorus | µg/L | 7.0 |
| Selenium (total) | µg/L | 10.0 |
| Sulfate | mg/L | 24.0 |
| Total Dissolved Solids | mg/L | 180.0 |
| Oil (hexane solubles or equivalent) | mg/L | 0.10 |
| Phenols | µg/L | 1.0 |

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

|  |  |  |
| --- | --- | --- |
| Constituent | Unit | Water Quality Standard |
| Benzene  | µg/L | 12.0 |
| Chlorobenzene | µg/L | 470.0 |
| 2,4-Dimethylphenol | µg/L | 450.0 |
| 2,4-Dinitrophenol | µg/L | 55.0 |
| Hexachloroethane (total) | µg/L | 5.30 |
| Lindane | µg/L | 0.47 |
| Methylene chloride | µg/L | 47.0 |
| Trichloroethylene | µg/L | 29.0 |

e) For the following bioaccumulative chemicals of concern (BCCs), acute aquatic life standards (AS) must not be exceeded at any time in any waters of the Lake Michigan Basin and chronic aquatic life standards (CS), human health standards (HHS), and wildlife standards (WS) must not be exceeded in any waters of the Lake Michigan Basin by the arithmetic average of at least four consecutive samples collected over at least four days subject to the limitations of Sections 302.520 and 302.530. The samples used to demonstrate compliance with the HHS and WS must be collected in a manner that assures an average representation of the sampling period.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Constituent | Unit | AS  | CS | HHS | WS |
| Mercury (total) | ng/L | 1,700 | 910 | 3.1 | 1.3 |
| Chlordane | ng/L | NA | NA | 0.25 | NA |
| DDT and metabolites | pg/L | NA | NA | 150 | 11.0 |
| Dieldrin | ng/L | 240 | 56 | 0.0065 | NA |
| Hexachlorobenzene | ng/L | NA | NA | 0.45 | NA |
| Lindane | µg/L | 0.95 | NA | 0.5 | NA |
| PCBs (class) | pg/L | NA | NA | 26 | 120 |
| 2,3,7,8-TCDD | fg/L | NA | NA | 8.6 | 3.1 |
| Toxaphene | pg/L | NA | NA | 68 | NA |

|  |
| --- |
| where: |
|  | mg/L | = | milligrams per liter (10-3 grams per liter) |
|  | µg/L | = | micrograms per liter (10-6 grams per liter) |
|  | ng/L | = | nanograms per liter (10-9 grams per liter) |
|  | pg/L | = | picograms per liter (10-12 grams per liter) |
|  | fg/L | = | femtograms per liter (10-15 grams per liter) |
|  | NA | = | Not Applied |

(Source: Amended at 47 Ill. Reg. 4437, effective March 23, 2023)