Chicago, IL

Chicago Earned a Water Quality and Compliance Grade of Excellent in 2000 and 2001

Contaminants present were found at levels averaging less than 25 percent of national standards.

▶ There were no recent reported violations of current, pending, or proposed national standards.

▶ **Trihalomethanes and haloacetic acids,** by-products of chlorine disinfection that may cause cancer, were found in Chicago's water but at an average of less than 25 percent of the new national standard.

▶ **Lead** was found in Chicago's water system but at relatively low levels. Lead—which enters drinking water supplies from the corrosion of pipes or faucets—can adversely affect blood pressure, red blood cells, and kidney and nervous system function and, especially in infants and children, cause permanent brain damage, decreased intelligence, and problems with growth, development, and behavior.

Chicago's Right-to-Know Reports Earned a Grade of Good for 2000 and 2001

▶ The reports were well formatted, revealed useful information, included warnings for vulnerable populations prominently, and made no overarching claims about the safety of the water supply.

▶ However, the reports misstated the EPA's health goal for coliform bacteria, thus making coliform levels in Chicago's water appear less troubling, and buried important information on lead contamination in a footnote.

CHICAGO
System Population Served **2,783,726**[1]
Water Quality and Compliance **2000▶Excellent** **2001▶Excellent**
Right-to-Know Report—Citizenship **2000▶Good** **2001▶Good**
Source Water Protection **Fair**
REPORT CARD

Chicago Earned a Source Water Protection Rating of Fair

According to the EPA's Index of Watershed Indicators (IWI), the Chicago area's stretch of Lake Michigan scored a 5 out of 6 (1 is least threatened, 6 most threatened). In the EPA's words, the "IWI score . . . describes the health of the aquatic resources for this watershed. A score of 5 indicates more serious water quality problems—low vulnerability to stressors such as pollutant loadings."[2] Lake Michigan receives wastewater from sewage treatment plants and industries, and runoff from agriculture (all generally far from Chicago's intakes), as well as runoff from urban and suburban areas. The quality of water in Lake Michigan has improved in the past 20 years, and the waters off the Illinois shoreline are considered to be in better condition than they have been in the past. While many pollution sources continue to discharge and run off into the lake, dilution and better pollution control have improved the lake's water quality in the Chicago area, contributing to a source water protection grade of Fair.

Noteworthy

▶ The city Department of Water has identified $620 million in capital improvements needed over the next five years to keep the city's water flowing reliably and of high quality.[3] Among the major projects are the replacement of 50 miles of water mains per year, rehabilitation and upgrade of the city's Jardine and South water purification plants, and upgrading a dozen neighborhood pumping stations to assure constant water pressure. The city claims that its aggressive pipe replacement program has saved 120 million gallons per day in reduced leakage from old, crumbling, and leaky pipes.[4]

KEY CONTAMINANTS IN CHICAGO'S WATER

The following contaminants have been found in Chicago's drinking water supply. For more information on health threats posed by specific contaminants, see Chapter 5.

MICROBIOLOGICAL CONTAMINANTS

Total Coliform Bacteria

National Standard (MCL)
5% maximum in any month, total coliform positive[5]

National Health Goal (MCLG)
0—no known fully safe level

2000 Levels
1% in highest month, total coliform positive

2001 Levels
2% in highest month, total coliform positive

LEVELS PRESENT SOME CONCERN

Total coliform bacteria are microbial contaminants whose presence is a potential indicator that disease-causing organisms may be present in tap water. Coliform bacteria on rare occasion are found in Chicago's water, at levels well below the national standard but nevertheless above the EPA's health goal. That said, even low levels of coliform could indicate bacteria regrowth in the city's distribution system. If unchecked, regrowth can become a serious problem in older water distribution systems, spurring degradation of water quality and potentially providing harborage for pathogens in the pipes. Chicago says it is in the process of a major infrastructure replacement program, replacing 50 miles of pipe per year. This would help reduce the risk of such distribution system problems.

INORGANIC CONTAMINANTS

Lead

National Standard (TT)
15 ppb (action level, at 90th percentile)[6]

National Health Goal (MCLG)
0—no known fully safe level of lead

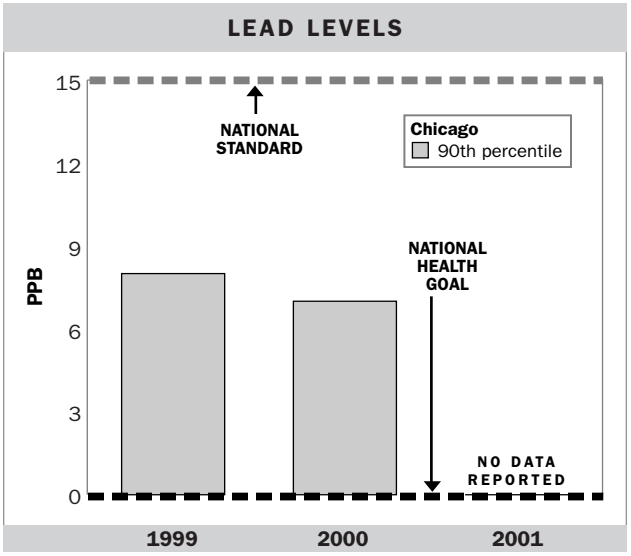
1999 Levels[7]
8 ppb at 90th percentile home, one home tested exceeded national standard

2000 Levels[8]
7 ppb at 90th percentile home, 0 homes tested exceeded national standard

2001 Levels
No data reported[9]

LEVELS PRESENT SOME CONCERN

Lead—which enters drinking water supplies from the corrosion of pipes or faucets—can cause permanent brain damage, decreased intelligence, and problems with growth, development, and behavior, as well as adversely affect blood pressure, red blood cells, and kidney and nervous system function. At one point, Chicago's plumbing code actually *required* lead service lines, so



the city's past problems with lead are not surprising. In 1993, for example, Chicago's water exceeded the 15 ppb EPA action level for lead, and the city was required to improve its corrosion control program under the EPA's Lead and Copper Rule. It now appears, assuming that monitoring was conducted correctly and targeted high-risk homes as required, that the improved corrosion control efforts of Chicago were successful.

Consumers, particularly those with infants or young children, may want to test their water for lead; to find a laboratory, contact the Drinking Water Hotline, 800-426-4791. Or consumers may choose to flush faucets of lead by running water for approximately one minute before ingestion. (Excess water may be saved for plants or other uses.)

ORGANIC CONTAMINANTS

Haloacetic Acids

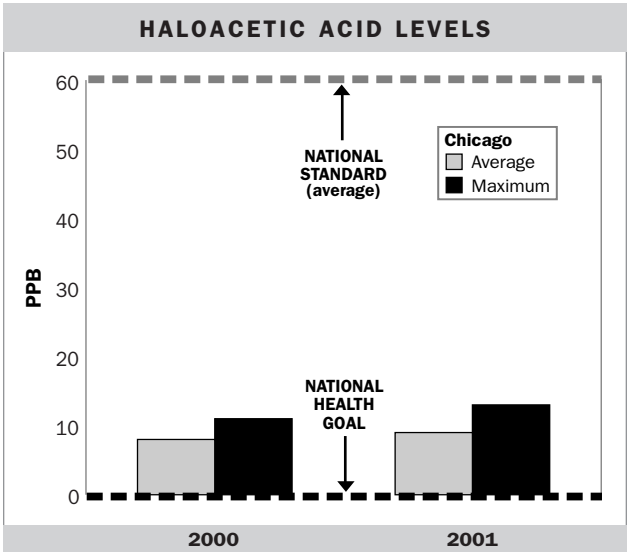
National Standard (MCL)
60 ppb (average) effective in 2002; no previous standard

National Health Goal (MCLG)
0—no known fully safe level[10]

2000 Levels[11]	Average 8 ppb	Maximum 11 ppb
2001 Levels[12]	Average 9 ppb	Maximum 13 ppb

LEVELS PRESENT SOME CONCERN

Haloacetic acids (HAAs), by-products of chlorine disinfection, may cause cancer and, potentially, reproductive and other health problems. Haloacetic acids



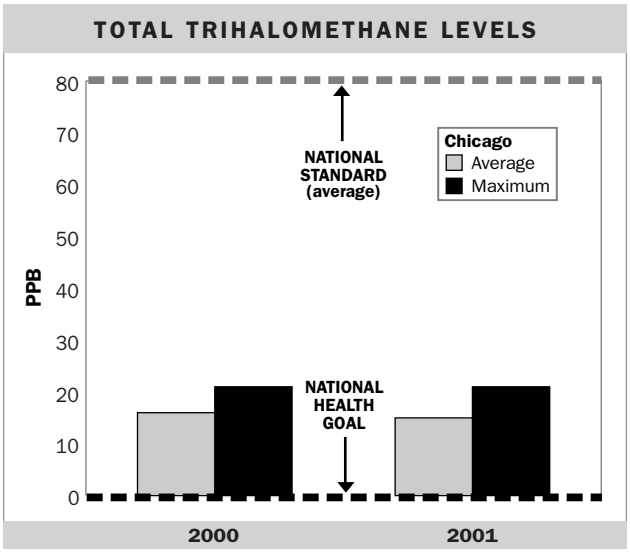
have been found in Chicago's water at levels well below the national standard but above the national health goal and do not appear to present major health concerns.

Total Trihalomethanes

National Standard (MCL)
100 ppb (average) effective through 2001
80 ppb (average) effective in 2002

National Health Goal (MCLG)
0—no known fully safe level[13]

2000 Levels	Average 16 ppb	Maximum 21 ppb
2001 Levels	Average 15 ppb	Maximum 21 ppb



Total trihalomethanes (TTHMs)—contaminants that result when chlorine is used to treat drinking water and then interacts with organic matter in the water—are linked with cancer and, potentially, to miscarriages and birth defects at elevated levels. Levels of TTHMs were found in Chicago's water at levels below the national standard and below the levels found to be linked to reproductive problems in preliminary studies, though still above the national health goal of 0. From what is known, Chicago's TTHM levels do not appear to present major health risks.

CHICAGO'S RIGHT-TO-KNOW REPORTS

Chicago's Right-to-Know Reports Earned a Grade of Good for 2000 and 2001

On the good-citizen side of the ledger:

▸ The format of the 2000 and 2001 reports and tables was relatively user-friendly.

▸ The reports revealed information on unregulated contaminants found in the city's water.

▸ They placed the warning for vulnerable populations prominently and early in the report.

▸ They included useful information on system rehabilitation and treatment.

▸ They made no overarching claim that the water is absolutely safe.

▸ They provided information on the source water assessment process and how to get involved.

On the could-be-a-better-citizen side of the ledger:

▸ The 2001 report buried the health warning and detailed information on lead contamination in a footnote at the bottom of a table, where it would have been unlikely to be noticed.

▸ The reports erroneously stated that the health goal, or MCLG, for coliform bacteria is a maximum of 5 percent coliform positive in any month; furthermore, the reports favorably compare Chicago's water to that health goal, stating that the water contained 1 to 2 percent coliform in the worst months. In fact, the health goal for coliform is 0, not 5 percent—and Chicago exceeded the MCLG, although it did not exceed the enforceable 5 percent standard.[14]

▶ Similarly, the reports erroneously state "N/A" (not applicable) for the MCLGs for the chlorination by-products bromodichloromethane and bromoform, both of which have health goals of 0, and both of which were found at fairly low levels in Chicago's tap water.[15]
▶ The 1999 right-to-know report buried information on a turbidity spike that occurred in November 1999. The Illinois EPA directed Chicago to mention the spike in its right-to-know report, but the information was only included in passing in a table with no explanatory information. In Milwaukee in 1993, a turbidity spike was associated with a major disease outbreak, but in Chicago, no such health threat was apparent. Nonetheless, Chicago minimized the importance of the turbidity spike, which could have threatened the health of a number of citizens, particularly the young, the elderly, cancer patients, and the immunocompromised.[16] This pre-2000 problem did not affect the grade for Chicago in 2000–2001.
▶ The reports included only one sentence translated into Spanish and no information in any other language. The percentage of Chicagoans who speak little or no English is growing. About 12.5 percent of Chicago residents speak primarily Spanish.[17] Chicago's one-sentence translation may have met minimum requirements, but the city could have done more to communicate with non-English speakers.
▶ Chicago included no maps showing source water or specific local sources of pollution. EPA rules require utilities to name known sources of any specific contaminant found in tap water.[18] In cases in which this is not required, or in the event that a specific polluter cannot be linked to a specific contaminant, EPA rules encourage water systems to highlight significant sources of contamination in the watershed.
▶ The reports failed to include explanations of the health effects of some contaminants found at levels above national health goals, including certain chemicals linked to cancer and possibly reproductive problems—for example, trihalomethanes. Although not legally required, this information would assist citizens in protecting their health and in fighting for better drinking water protection. Chicago's unusually low levels of disinfection by-products (as compared to levels in most U.S. cities) make this requirement less urgent than elsewhere.

THREATS TO CHICAGO'S SOURCE WATER

Chicago Earned a Source Water Protection Rating of Fair

According to the EPA's Index of Watershed Indicators (IWI), the Chicago area's stretch of Lake Michigan scored a 5 on a scale of 1 to 6, where 1 is least threatened and 6 most threatened. In the EPA's words, "The overall IWI score . . . describes the health of the aquatic resources for this watershed. A score of 5 indicates more serious water quality problems—low vulnerability to stressors such as pollutant loadings."[19] Lake Michigan receives wastewater from sewage treatment plants and industries, and runoff from agriculture (all generally far from Chicago's intakes), as well as runoff from urban and suburban areas. As the Chicago right-to-know reports noted, the quality of water in Lake Michigan has improved in the past 20 years, and the waters off the 63 miles of Illinois shoreline are considered to be in better condition than they were in the past.

A combination of actions substantially improved Lake Michigan's water quality around Chicago. Although some pollution sources continue to discharge and run off into the lake, nonetheless much of the Chicago area pollution no longer reaches the lake as a result of improved pollution control, dilution, reversal of the flow of the polluted Chicago River in 1900, and the diversion of most suburban waste from the lake via two canals completed a century ago. Unfortunately for cities downstream, however, much of this pollution is exported to the Mississippi.[20]

PROTECTING CHICAGO'S DRINKING WATER

Following are approaches to treating Chicago's drinking water and information on how residents can help protect their local water.

Treatment Options Available for Contaminants of Greatest Concern

Chicago's disinfection by-product levels are relatively low compared to those in many cities relying on surface waters; still, they could be further reduced by additional or alternative treatment. For example,

activated carbon and/or the use of an alternative primary disinfectant such as ozone or ultraviolet light could further reduce by-product levels. Chloramines could be used as an alternative residual disinfectant instead of chlorine to further reduce by-products. In addition, although Chicago claims never to have found viable *Cryptosporidium* in its finished drinking water, ozone and ultraviolet light would offer a measure of additional assurance against *Crypto*, since these disinfection technologies are far more effective than is chlorine (the disinfectant used by Chicago).

Current and Future Threats to Source Water

Chicago and the state of Illinois have not yet completed a required source water assessment for Chicago and must do so by 2003. However, as is indicated in the map of potential sources of water pollution in the region, industrial polluters, hazardous waste dumps, sewage treatment plants, urban runoff, and other potential sources of water pollution are near enough to pollute the lake. Still, most major dischargers either do not discharge into Lake Michigan or do so at a significant distance from the city's drinking water intakes.

The reversal of the flow of the Chicago River many decades ago, undertaken to reduce the pollution reaching Lake Michigan, has reduced local sources of pollution, although communities downstream along the Chicago River have been put at risk as a result. Significant problems can arise on the rare occasions when locks must be opened after heavy rains, allowing a backflow of pollution into the lake, but this is rare.[21] The city tries to compensate for such events by increasing chlorination of the water. The downside of this measure is increased levels of chlorine and chlorination by-products in the water.[22]

CHICAGO

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WATER UTILITY INFORMATION

Complacency about the quality of lake water is ill-advised. For example, in 1993, in Milwaukee—which also relies on intakes in Lake Michigan—400,000 residents were sickened by *Cryptosporidium* from their tap water, which somehow became contaminated with the parasite.

How Individuals Can Protect Source Water

Citizens can help protect the city's drinking water by working to protect its sources—both by conserving water in their daily lives and by getting involved in community decision making about water resources.

- **Attend meetings of the Chicago Department of Water** (see contact information, this page). Ask for dates, times, and locations.
- **Get involved in source water assessment and protection efforts** by contacting the Chicago Water Department or Anthony Dulka, Illinois EPA, Bureau of Water, Groundwater Section, 217-785-4787.
- **Learn more from these groups:**
  - Citizens for a Better Environment, 312-346-8870
  - Clean Water Network, www.cwn.org

Peer reviewers of the Chicago report included Albert Ettinger, Environmental Law & Policy Center, Chicago, and Dr. Linda Greer, senior scientist, NRDC.

NOTES

1 Environmental Protection Agency, Safe Drinking Water Information System (SDWIS), Chicago report, available online at www.epa.gov/safewater/dwinfo/il.htm, visited March 13, 2002.

2 EPA Index of Watershed Indicators, at www.epa.gov/iwi/hucs/07120003/score.html (visited March 13, 2002).

3 "Chicago 2000 Water Quality Report."

4 Ibid.

6 Note that the contaminant levels are presented as a percentage. Total coliform is regulated as a percentage of positive samples that are present in water. The national health standard of 5 percent means that if more than 5 percent of the utility's total coliform samples test positive, then the national health standard has been violated. To say that a sample tests positive is to say that there are total coliform bacteria present in the sample. Therefore, for compliance purposes, the utilities provide the percentage of total coliform samples that tested positive.

6 The action level standard for lead is different from the standard for most other contaminants. Water utilities are required to take many samples of lead in the tap water at homes they serve, including some "high-risk" homes judged likely to have lead in their plumbing or fixtures. If the amount of lead detected in the samples is more than 15 ppb at the 90th percentile (which means that 90 percent of the samples have 15 ppb or less), then the amount is said to exceed the action level. Under the complex EPA lead rule,

a water system that exceeds the action level is not necessarily in violation. If a system exceeds the action level, additional measures such as chemical treatment to reduce the water's corrosivity (ability to corrode pipes and thus its ability to leach lead from pipes) must be taken. If this chemical treatment does not work, the water system may have to replace lead portions of its distribution system if they are still contributing to the lead problem.

7 "Chicago 1999 Water Quality Report."

8 "Chicago 2000 Water Quality Report."

9 "Chicago 2001 Water Quality Report."

10 Some of the haloacetic acids have national health goals of 0 and others have nonzero goals. For the sake of simplicity and understandability, since there is a single haloactetic acid standard, and because it is essentially chemically impossible under normal conditions in tap water to create one regulated haloacetic acid without creating the others at some level, we have listed the national health goal as 0.

11 See note 6.

12 See note 7.

13 Total trihalomethanes (TTHMs) consist of a sum of the levels of four closely related chemicals—chloroform, dibromochloromethane, bromoform, and bromodichloromethane—which occur together at varying ratios when water is chlorinated. The latter two TTHMs have health goals of 0. The EPA promulgated and then withdrew (after a court decision) a 0 health goal for chloroform and has not yet issued a new goal for chloroform. Dibromochloromethane has a health goal of 60 ppb. Since water systems generally report only the combined TTHM level, and since it is essentially chemically impossible to create one trihalomethane in tap water without some level of the others, we list the health goal for TTHMs as 0.

14 The 0 MCLG for coliform is found at 40 C.F.R. §141.52(4).

15 The 0 MCLGs for bromodichloromethane and bromoform are found at 40 C.F.R. §141.53.

16 See letter from Roger Selburg, Illinois EPA, to Ellen Flanagan, deputy commissioner, Chicago Water Department, December 20, 1999, and attachments.

17 See "Languages Spoken Other Than English," table on page TK. According to a recent *Chicago Tribune* article, "The number of Illinoisans at least 5 years old who speak Spanish at home jumped from about 728,000 in 1990, or 6.8 percent, to more than 1.2 million in 2000, about 11 percent of the population, the new data revealed. . . . Nearly 6 percent of Illinois residents spoke Polish, German, Russian, or some other European language at home, while 2 percent spoke an Asian or Pacific Island language, data showed." David Mendell and Achy Obejas, "English on Wane in Illinois Households: Census Cites Rise of Other Languages" (August 6, 2001).

18 See EPA regulations at 40 C.F.R. §141.153(d)(4)(ix), which provide that the right-to-know report must include "the likely source(s) of detected contaminants to the best of the operator's knowledge. Specific information about the contaminants may be available in sanitary surveys and source water assessments and should be used when available to the operator." While EPA allows reliance upon general lists of potential sources where the water system is not aware of the specific source of pollution and where the water system is aware of the pollution source, the rules require that polluters to be identified.

19 See note 2.

20 For a brief history of the reengineering of the Chicago River, and the diversion of area sewage from Lake Michigan into the Mississippi, see Chicago Public Library, "1900: Flow of the Chicago River Reversed," available online at www.chipublib.org/004chicago/timeline/riverflow.html.

21 Personal communication with Albert Ettinger, Environmental Law & Policy Center, May 29, 2002.

22 Ibid.