Physical & Mineral Characteristics
For Calendar Year 2004

Constituent	Annual Range Detected	Annual Average
Alkalinity, ppm	8.0 - 36.0	23.2
Aluminum, ppm	0.010 - .035	0.018
Calcium, ppm	2.3 - 9.8	4.6
Carbon Dioxide	1.0 - 11.0	4.3
Chloride, ppm	5.0 - 19.0	9.5
Chlorine, ppm	0.20 - 2.22	0.99
Conductivity	57.7 - 143.4	106.3
Hardness, ppm	14.0 - 42.0	28.3
Manganese, ppb	ND - 0.020	<0.005
Magnesium, ppm	1.36 - 2.74	1.77
Phosphorus, ppm	0 04 - 1.2	0.43
Potassium, ppm	1.49 - 3.20	2.41
Silica, ppm	8.0 - 14.5	11.93
Sodium, ppm	7.16 - 12.10	9.7
Avg Temperature, deg. C	2.0 - 28.5	17.3
Zinc, ppm	0.206 - 0.509	0.344
pH, standard units	6.88 - 7.87	7.29

Cryptosporidium sp.

Cryptosporidium sp. is a microscopic organism that, when ingested, can cause diarrhea, fever and other gastrointestinal symptoms. The organism occurs naturally in surface waters (lakes & streams) and comes from animal waste. Cryptosporidium sp. is eliminated by an effective treatment combination of coagulation, sedimentation, filtration, and disinfection. Both of the city's water sources were tested monthly for Cryptosporidium sp. from 1994-1998, but it was not detected. Cryptosporidium sp. has never been detected in our treated drinking water.

Special Concerns

Some people may be more vulnerable to contaminants in drinking water than the general population. People whose immune systems have been compromised -- such as people with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants -- can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. Environmental Protection Agency and Centers for Disease Control guidelines on appropriate means to lessen risk of infection by Cryptosporidium sp. and other microbiological contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791.

Protecting Our Water Sources

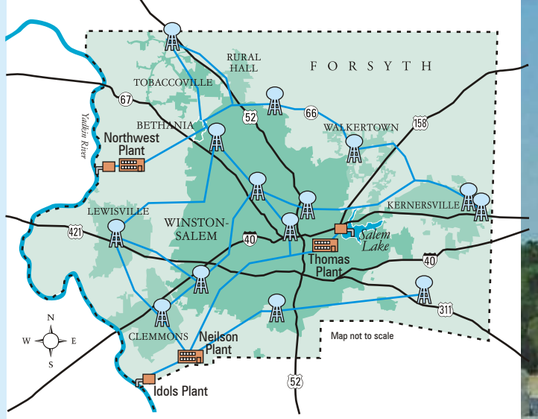
Sources of drinking water (both tap and bottled) include rivers, lakes, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- **Microbial Contaminants** such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic Contaminants** such as salts and metals which can be naturally-occurring or result from urban storm water runoff, industrial or wastewater discharges, oil and gas productions, mining or farming.
- **Pesticides and herbicides**, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- **Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can come from gas stations, urban storm water runoff, and septic systems.
- **Radioactive contaminants** which can be naturally occurring or the result of oil and gas production and mining activities.

To ensure that tap water is safe to drink, the Environmental Protection Agency limits the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at (800) 426-4791.



The water system for Winston-Salem and Forsyth County serves more than 300,000 people with an average daily demand of approximately 43.2 million gallons.

EN ESPAÑOL

Si desea recibir una copia de este reporte en Español o si tiene preguntas con respecto a la calidad del agua que consume, por favor comuniquese con el departamento the servicios públicos durante las horas de trabajo, el teléfono es 727-8418.

The Winston-Salem/Forsyth County water system is operated by the City/County Utility Commission. The commission meets monthly the second Monday of each month at 2 p.m. in City Hall South, Room 530, 100 E. First Street, Winston-Salem, N.C. For questions about this report or the quality of our drinking water, call Utilities Administration at 336 727-8418.

Produced by the
Winston-Salem/Forsyth County Utility Commission
100 E. First St., Suite 131
Winston-Salem, N.C. 27102l
336 727-8418

Designed by City of Winston-Salem
Marketing and Communications Department

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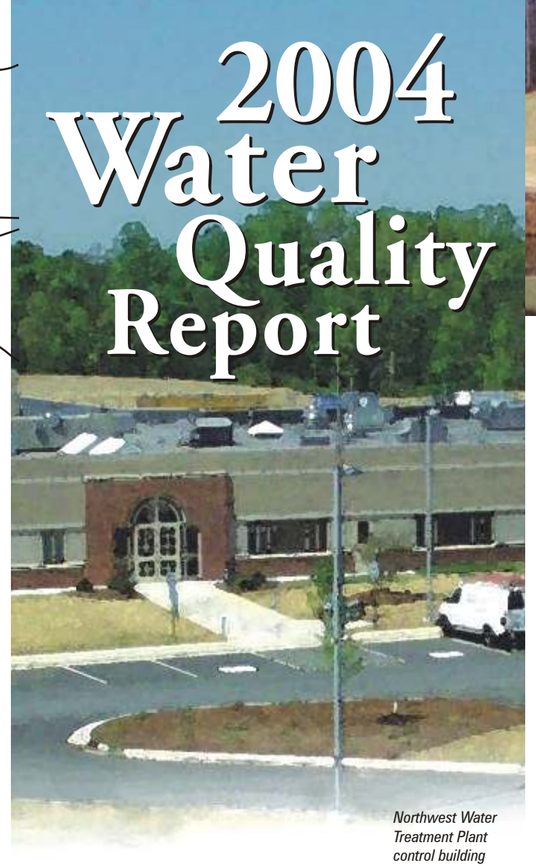
go to www.cityofws.org

2004 Water Quality Report



Northwest Water Treatment Plant control building

Winston-Salem • Forsyth County
City/County Utilities
Water • Sewer • Solid Waste Disposal

Northwest Water Treatment Plant's dam and pump station is capable of pulling 50 million gallons a day out of the Yadkin River.

Winston-Salem/Forsyth County Utility Commission drinking water exceeds all water quality standards

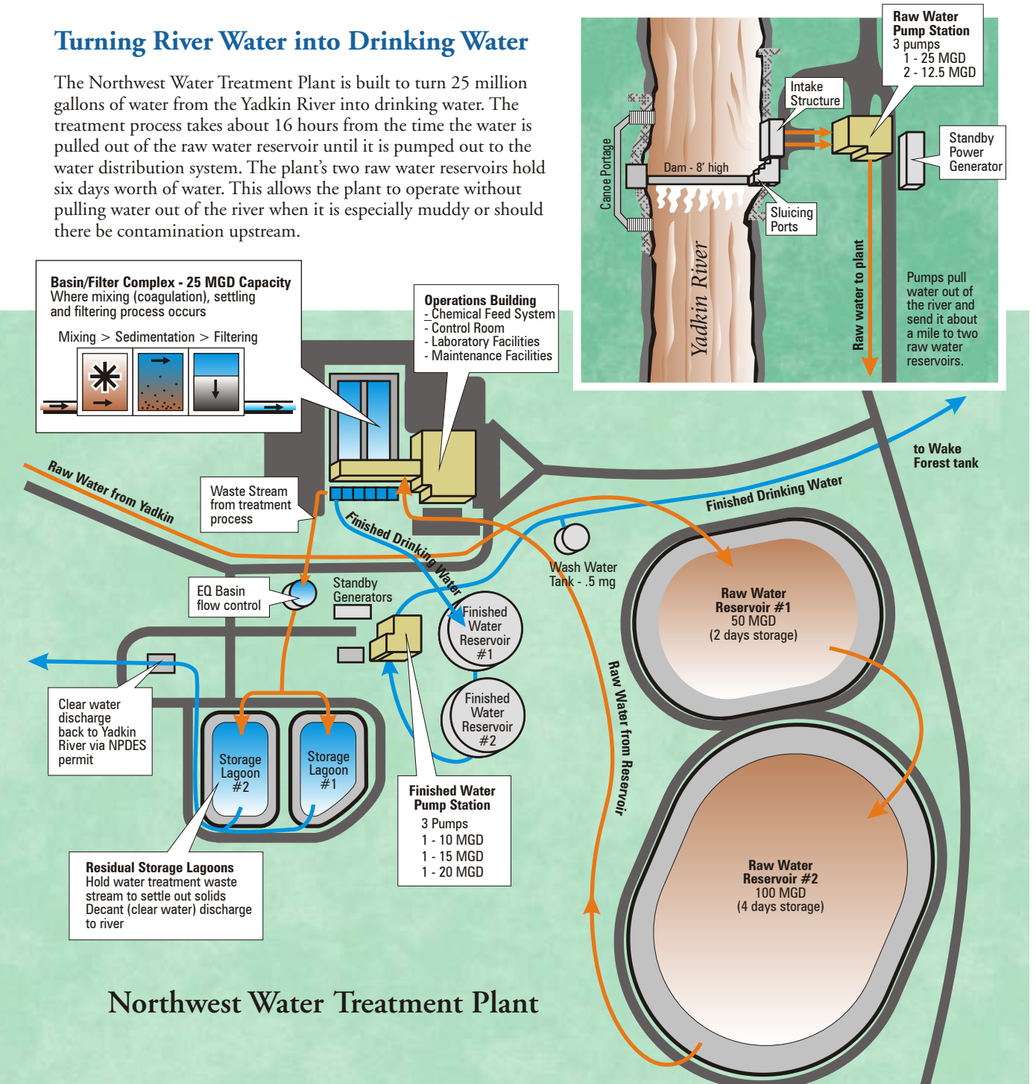
The Winston-Salem/Forsyth County Utility Commission operates three water treatment facilities drawing water from both the Yadkin River and Salem Lake. Together, these water treatment facilities can produce 97 million gallons per day of drinking water. The Neilson and Northwest Water Plants can treat 48 and 25 million gallons per day, respectively, from the Yadkin River. The Thomas Water Plant can treat 24 million gallons per day from either the Yadkin River or Salem Lake.

For 2004, as in previous years, these treatment facilities have met or exceeded all state and federal (EPA) standards for drinking water quality. This accomplishment reflects the quality and dedication of the employees who work year-round to provide adequate supplies of safe drinking water.

This brochure includes details about where your drinking water comes from, how it is treated, what it contains, and exactly how it compares to state and federal standards. The Utility Commission is providing this information to you because it is committed to delivering a quality product for its customers. This report is updated on a regular basis and mailed annually to our customers.

Turning River Water into Drinking Water

The Northwest Water Treatment Plant is built to turn 25 million gallons of water from the Yadkin River into drinking water. The treatment process takes about 16 hours from the time the water is pulled out of the raw water reservoir until it is pumped out to the water distribution system. The plant's two raw water reservoirs hold six days worth of water. This allows the plant to operate without pulling water out of the river when it is especially muddy or should there be contamination upstream.



Source Water Assessment Program Results

In 2004, the North Carolina Department of Environment and Natural Resources, Public Water Supply Section, Source Water Assessment Program (SWAP) assessed all drinking water sources across North Carolina. The assessments determined the susceptibility of each drinking water source (well or surface water intake) to potential contaminants. The results of the assessments are available in SWAP Assessment Reports that include maps, background information and a relative susceptibility rating of Higher, Moderate or Lower.

The relative susceptibility rating of each source for the city of Winston-Salem was determined by combining the contaminant rating (number and location of potential contaminant sources (PCS's) within the assessment area) and the inherent vulnerability rating (i.e., characteristics or existing conditions of the well or watershed and its delineated assessment area). The assessment findings are summarized in the table below:

Source	Susceptibility Rating
Yadkin River	Higher
Salem Lake	Higher

It is important to understand that a susceptibility rating of "higher" does not imply poor water quality, only the systems' potential to become contaminated by PCS's in the assessment area.

The complete SWAP Assessment Report for the city of Winston-Salem may be viewed on the Web at: www.deh.enr.state.nc.us/pws/swap. To obtain a printed copy of this report, please mail a written request to: Source Water Assessment Program - Report Request, 1634 Mail Service Center, Raleigh, NC 27699-1634, or email request to swap@ncmail.net. Please indicate the system name (City of Winston-Salem), PWSID No. (NC0234010), and provide your name, mailing address and phone number. If you have any questions about the SWAP report, please contact the Source Water Assessment staff by phone at 919-715-2633.

Treated Water Quality

The following substances were detected in the Winston-Salem/Forsyth County public water supply during the 2004 calendar year.*

Regulated at the Treatment Plant

Substance	Highest Level Allowed (EPA's MCL[1])	Ideal Goals (EPA's MCLG[2])	Range of Detection	Average Level Detected	Source
Barium, ppm[3]	2.0	2.0	0.013-0.037	0.024	Natural geology; drilling operations; metal refinery wastes
Fluoride, ppm	4.0[4]	4.0	0.84 - 1.07	0.97	Natural geology; water treatment additive
Nitrate, ppm	10.0	10.0	0.44 - 1.09	0.64	Runoff/erosion of natural deposits or leaching from septic tanks
Total Organic Carbon	Treatment Technique[5]	n/a	0.80 - 2.10	1.23	Natural organic matter
Turbidity, NTU[6]	Treatment Technique[7]	n/a	0.02 - 0.22	0.07	Natural geology; soil run off

Regulated in the Distribution System

Substance	Highest Level Allowed (EPA's MCL[1])	Ideal Goals (EPA's MCLG[2])	Range of Detection	Average Level Detected	Source
Total Trihalomethanes, ppb[8]	80 RAA[9]	0.0	10.0 - 74.0	RAA = 35.3	Byproducts of drinking water disinfection
Total Haloacetic Acids ppb	60 RAA	0.0	11.5 - 52.7	RAA = 30.2	Byproducts of drinking water disinfection
Total Coliform	Less than 5% positive	0.0	n/a	0.0	Natural geology
Alpha Emitters, pCi/L[10]	15	0.0	0.0	0.0	Natural geology
Beta Emitters, pCi/L	50	0.0	0.0	0.0	Natural geology and man--made sources

Unregulated Substances

Substance	Highest Level Allowed (EPA's MCL[1])	Ideal Goals (EPA's MCLG[2])	Range of Detection	Average Level Detected	Source
Bromodichloromethane, ppb	Not Regulated	Not Regulated	3.0 - 11.0	6.7	Component of the trihalomethanes
Chlorodibromomethane, ppb	Not Regulated	Not Regulated	ND[11] - 2.0	0.80	Component of the trihalomethanes
Chloroform, ppb	Not Regulated	Not Regulated	7.0 - 64.0	30.0	Component of the trihalomethanes
Monochloroacetic Acid	Not Regulated	Not Regulated	ND - 11.5	2.3	Component of Haloacetic acids
Dichloroacetic Acid	Not Regulated	Not Regulated	6.6 - 26.3	16.7	Component of Haloacetic acids
Trichloroacetic Acid	Not Regulated	Not Regulated	4.9 - 21.0	13.9	Component of Haloacetic acids
Sulfate, ppm	500 proposed	Not Regulated	7.60 - 23.51	12.3	Natural geology

Regulated at the Consumers' Tap

Substance	Highest Level Allowed (EPA's MCL)	Ideal Goals (EPA's MCLG)	Number of Sites Sampled	Number of Sites Above the Action Level	90th Percentile Concentration, ppb	Source (both lead and copper)
Lead, ppb	15.0 (action level[12])	0.0	73.0	4.0	4.0	Corrosion of household plumbing;
Copper, ppm	1.30 (action level)	1.3	73.0	0.0	0.1	erosion of natural deposits.

Definitions:

[1] **Maximum Contaminant Level (MCL)** - The highest level of a contaminant that is allowed in drinking water.

[2] **Maximum Contaminant Level Goal (MCLG)** - The level of a contaminant in drinking water below which there is no known or expected risk to health.

[3] **ppm** - One part per million.
(For example, one penny in $10,000.)

[4] The EPA's maximum contaminant level for fluoride is 4.0 mg/L, however the State of North Carolina has established a maximum contaminant level of 2.0 mg/L.

[5] **Treatment technique** - Treatment technique for total organic carbon was complied with throughout 2004.

[6] **NTU** - nephelometric turbidity unit, a measure of the cloudiness of water.

[7] **Treatment technique** - No more than 5% of measurements in a given month may exceed 0.3 NTU.

[8] **ppb** - One part per billion.
(For example, one penny in $10,000,000.)

[9] **Running annual average** - last four quarterly samples collected from the system.

[10] **PCi/L** - Picocuries per liter is a measure of the radioactivity in water. A picocurie is 10^{-12} curies and is the quantity of radioactive material producing 2.22 nuclear transformations per minute.

[11] **ND** - Not detected.

[12] **Action Level** - The concentration of a contaminant that triggers treatment or other requirement that a water system must follow. Action levels are reported at the 90th percentile for homes at greatest risk.

Copies of these results can be obtained by calling the City/County Utilities Water Quality Line at 336-946-2524.

** The city of Winston-Salem received a reporting violation in 2004 for iron testing. The city collected and analyzed the required sample but failed to report the results to the NC Department of Environment and Natural Resources within the required time frame. The results for iron were "not detected."*