# CITY OF HARRISONBURG, VIRGINIA

## 2000 ANNUAL DRINKING WATER QUALITY REPORT

The City of Harrisonburg is proud to announce that our public water supply system is in compliance with all state and federal waterworks regulations. There have been no violations of a contaminant level or of any other water quality standard.

## Water Sources

- North River in Bridgewater, Va
- Dry River in Rawley Springs, Va
- Silver Lake in Dayton, Va

The North River and Dry River are surface water sources and Silver Lake is a ground water source under the influence of surface water.

The Harrisonburg Water Treatment Plant routinely monitors for constituents in your drinking water. We're proud that your drinking water meets or exceeds all federal and state requirements. All 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 that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's hotline number: **1-800-426-4791**.

The table of the following page shows the results of our monitoring for the period of

**January 1st to December 31st, 2000.**

Some constituents have been detected but the EPA has determined that

**YOUR WATER IS SAFE.**

## Water Supply Strategy
### *The Planned Future*

The utility companies of the twenty first century will no doubt be targeting water supplies which are good quality, reliable and cost effective. These same features are foremost within the city's strategy to balance the use of water from Switzer Dam / Rawley Springs, North River at Bridgewater and the South Fork of the Shenandoah River.

### Switzer Dam / Rawley Springs

The pristine waters of the Rawley Springs watershed provide the best quality water at the most cost effective price. Located at the headwaters to Dry River, this watershed is small.The natural streamflows fluctuate widely and the topography is limiting in developing natural or additional man made storage.

For water supply planning, this source can be considered for no more than its safe yield under drought conditions. Reliability of this source is a major issue, however, the city's water supply strategy includes the construction of larger infrastructure piping to nearly double annual use of this source by withdrawing more water when it is available. To make feasible this project, a complimentary source is necessary during dry conditions.

### North River at Bridgewater

Harrisonburg currently takes the majority of its supply from this source. The withdrawal is located in the mid area of the North River watershed where runoff conditions impart extreme fluctuations to the stream flowrate and pollutant concentrations. Current city withdrawals are regarded as reaching maximum level during environmentally sensitive dry conditions.

**Continued on page 5**

| TEST RESULTS | | | | | | |
|---|---|---|---|---|---|---|
| Contaminant | Violation Y/N | Level Detected | Unit Measurement | MCLG | MCL | Likely Source of Contamination |
| **Microbiological Contaminants** | | | | | | |
| 1. Turbidity | N | .08 | NTU | n/a | TT | Soil runoff |
| **Radioactive Contaminants** | | | | | | |
| 2. Beta/photon emitters | N | 1.7 | mrem/yr | 0 | 4 | Decay of natural and man-made deposits |
| 3. Alpha emitters | N | 0.2 | PCi/1 | 0 | 15 | Erosion of natural deposits |
| **Inorganic Contaminants** | | | | | | |
| 4. Antimony | N | <2.0 | Ppb | 6 | 6 | Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder |
| 5. Arsenic | N | <2.0 | Ppb | n/a | 50 | Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes |
| 6. Barium | N | <0.2 | Ppm | 2 | 2 | Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits |
| 7. Beryllium | N | <2.0 | Ppb | 4 | 4 | Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries |
| 8. Cadmium | N | <2.0 | Ppb | 5 | 5 | Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints |
| 9. Chromium | N | <10.0 | Ppb | 100 | 100 | Discharge from steel and pulp mills; erosion of natural deposits |
| 10. Copper | N | <0.2 | Ppm | 1.3 | AL=1.3 | Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives |
| 11. Cyanide | N | <10.0 | Ppb | 200 | 200 | Discharge from steel/metal factories; discharge from plastic and fertilizer factories |
| 12. Fluoride | N | <0.91 | Ppm | 4 | 4 | Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories |
| 13. Lead | N | <2.0 | Ppb | 0 | AL=15 | Corrosion of household plumbing systems, erosion of natural deposits |
| 14. Mercury (inorganic) | N | <0.2 | Ppb | 2 | 2 | Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland |
| 15. Selenium | N | <10.0 | Ppb | 50 | 50 | Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines |
| 16. Thallium | N | <2.0 | Ppb | 0.5 | 2 | Leaching from ore-processing sites; discharge from electronics, glass, and drug factories |
| **Synthetic Organic Contaminants including Pesticides and Herbicides 1999 Data** | | | | | | |
| 17. 2,4-D | N | <0.5 | Ppb | 70 | 70 | Runoff from herbicide used on crops |
| 18. 2,4,5-TP (Silvex) | N | <0.2 | Ppb | 50 | 50 | Residue of banned herbicide |
| 19. Alachlor | N | <0.2 | Ppb | 0 | 2 | Runoff from herbicide used on row crops |
| 20. Atrazine | N | <0.1 | Ppb | 3 | 3 | Runoff from herbicide used on row crops |
| 21. Carbofuran | N | <0.9 | Ppb | 40 | 40 | Leaching of soil fumigant used on rice and alfalfa |

| | | | | | | |
|---|---|---|---|---|---|---|
| 22. Chlordane | N | <0.2 | Ppb | 0 | 2 | Residue of banned termiticide |
| 23. Dalapon | N | <1.0 | Ppb | 200 | 200 | Runoff from herbicide used on rights of way |
| 24. Dibromochloropropane | N | <0.02 | Nanograms/ 1 | 0 | 200 | Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards |
| 25. Dinoseb | N | <0.2 | Ppb | 7 | 7 | Runoff from herbicide used on soybeans and vegetables |
| 26. Endrin | N | <0.02 | Ppb | 2 | 2 | Residue of banned insecticide |
| 27. Ethylene dibromide | N | <0.01 | Nanograms/1 | 0 | 50 | Discharge from petroleum refineries |
| 28. Heptachlor | N | <0.04 | Nanograms/1 | 0 | 400 | Residue of banned termiticide |
| 29. Heptachlor epoxide | N | <0.02 | Nanograms/1 | 0 | 200 | Breakdown of heptachlor |
| 30. Hexachlorobenzene | N | <0.1 | Ppb | 0 | 1 | Discharge from metal refineries and agricultural chemical factories |
| 31. Hexachlorocyclo-pentadiene | N | <0.1 | Ppb | 50 | 50 | Discharge from chemical factories |
| 32. Lindane | N | <0.1 | Nanograms/l | 200 | 200 | Runoff/leaching from insecticide used on cattle, lumber, gardens |
| 33. Methoxychlor | N | <0.2 | Ppb | 40 | 40 | Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock |
| 34. Oxamyl [Vydate] | N | <2.0 | Ppb | 200 | 200 | Runoff/leaching from insecticide used on apples, potatoes and tomatoes |
| 35. PCBs [Polychlorinated biphenyls] | N | <0.1 | Nanograms/ 1 | 0 | 500 | Runoff from landfills; discharge of waste chemicals |
| 36. Pentachlorophenol | N | <0.04 | Ppb | 0 | 1 | Discharge from wood preserving factories |
| 37. Picloram | N | <0.1 | Ppb | 500 | 500 | Herbicide runoff |
| 38. Simazine | N | <0.07 | Ppb | 4 | 4 | Herbicide runoff |
| 39. Toxaphene | N | <0.5 | Ppb | 0 | 3 | Runoff/leaching from insecticide used on cotton and cattle |
| **Volatile Organic Contaminants:** Likely sources of contamination would be discharge from factories, leaching from gas storage tanks and landfills, urban storm water runoff, and septic systems. Year 2000 test results indicated that the regulated substances in this contaminant category were below the minimum level of detection. | | | | | | |

# Some Helpful Definitions:

**Ppm** ***(parts per million) or*** **mg/l** ***(milligrams per liter):***
one part per million = one cent in $10,000 or
one minute in two years

**Ppb** ***(parts per billion) or Micrograms per liter:***
one part per billion = one cent in $10,000,000 or
one minute in 2,000 years

**Ppt** ***(parts per trillion) or*** **nanograms/l** ***(nanograms per liter):*** one part per trillion = one cent in $10,000,000,000 or
one minute in 2,000,000 years

**mrem/yr** ***(Millerems per year)*** – measure of radiation absorbed by the body.

**TT** ***(Treatment Technique)*** **-** A required process intended to reduce the level of a contaminant in drinking water.

**PCi/L** ***(Picocuries per liter)*** - picocuries per liter is a measure of the radioactivity in water.

**NTU** ***(Nephelometric Turbidity Unit)*** – A measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

**AL** ***(Action Level)*** **-** the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

**MCL** ***(Maximum Contaminant Level)*** - The "Maximum Allowed" is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

**MCLG** ***(Maximum Contaminant Level Goal)*** **-** The "Goal" is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety

# Do I Need To Take Special Precautions ?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons 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.

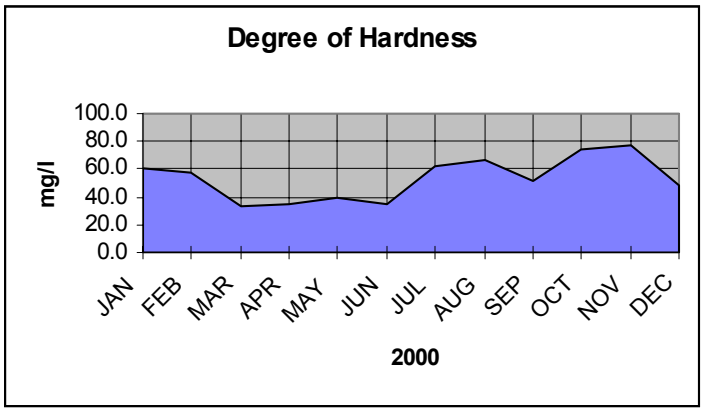
These people should seek advice about drinking water from their health care providers. The Environmental Protection Agency and Center for Disease Control publishes guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbiological contaminants. These guidelines are available at the Safe Drinking Water Hotline:
1-800-426-4791.

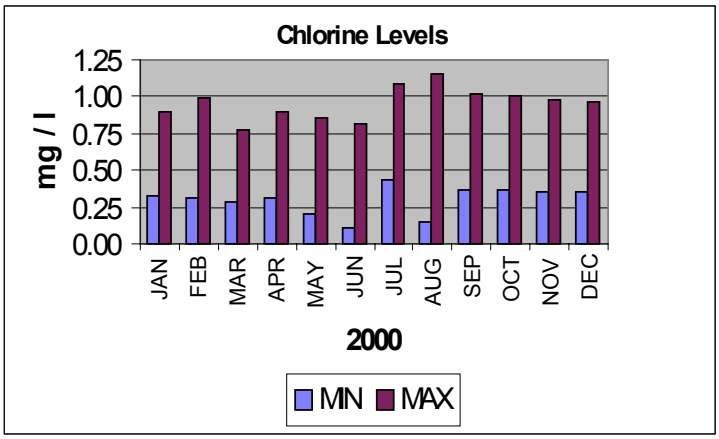
## Subjects of Frequently Asked Questions

## Hardness:

| | |
|---|---|
| Excessive | > 180 mg/l |
| Hard | 121 - 180 mg/l |
| Moderate | 61 - 120 mg/l |
| Soft | 0 - 60 mg/l |

Most households are comfortable with a moderate level of 61-120 mg/l. On average, the range for the degree of hardness in our water for the year 2000 was 34-78 mg/l. The water should not contribute to skin dryness or force you to use an excessive amount of detergent or bleach for a load of clothes.



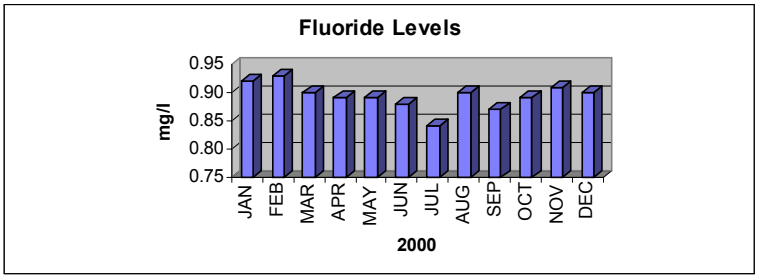




## Chlorine:

Chlorine is added to the water as a public safety measure. It acts as a disinfectant by clearing the water of undesirable elements and has a positive effect on the overall taste. The concentration does vary depending on your location within the water distribution system.

Tests are conducted at various locations in the city. Level should be above .2 mg/l in distribution.

**Fluoride:** Fluoride is added to the finished water at the Water Treatment Plant for the purpose of preventive health as recommended by the American Dental Association.



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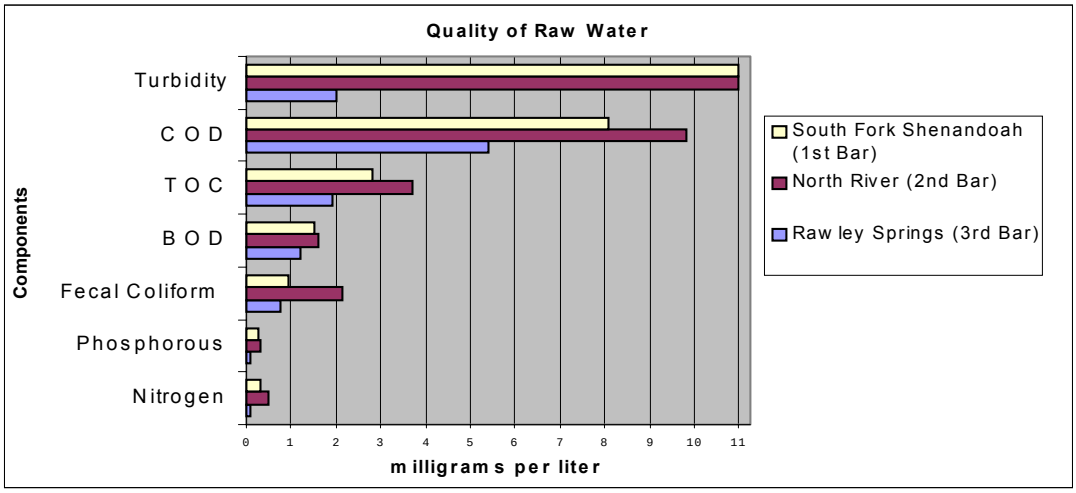
## South Fork Shenandoah River (Future)

The South Fork Shenandoah source will be located in a lower drainage region where streamflows are 6 to 15 times larger than existing sources. For this reason, and the effect of Harrisonburg's recycle discharge upstream, this source is the complimentary piece of the puzzle to accommodate the Rawley Springs enhancement project.

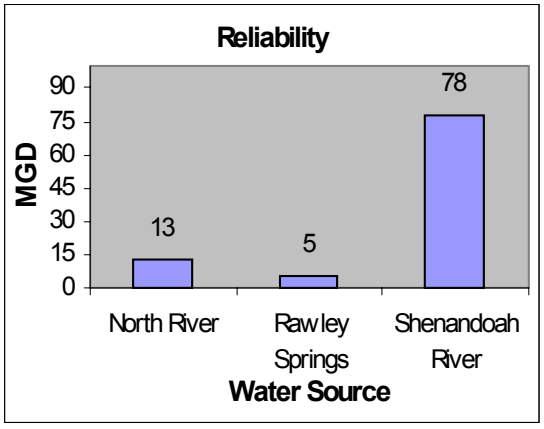
## QUALITY – RELIABILITY – COST COMPARISON

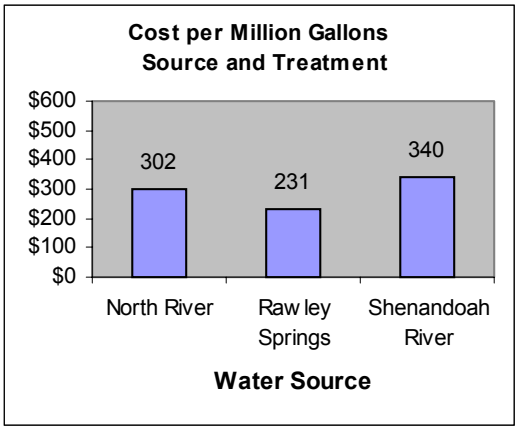



C O D – Chemical Oxygen Demand  B O D – Biological Oxygen Demand  T O C – Total Organic Carbon  Fecal Coliform figures times 1000

All water sources are treatable to meet drinking water standards.

"No South Fork Shenandoah water samples analyzed were greater than ten percent of the risk-based concentration for methylmercury in tap water. For this reason, according to USEPA guidelines, waters in the sampled area below the Dupont plant would not be considered hazardous to human health in regard to mercury content." (Old Dominion University Research Foundation, 1998)




| Water Source | Reliability Safe Yield | Cost per Million Gallons Source and Treatment |
|---|---|---|
| North River | 13 MGD | $340 |
| Rawley Springs | * 5 MGD | $231 |
| Shenandoah River | 78 MGD | $467 |

* Rawley Springs – By controlled release from Switzer Dam