



CITY OF PORTSMOUTH • DEPARTMENT OF PUBLIC UTILITIES


2003  
WATER  
QUALITY



The drought of 2002 presented challenges to Portsmouth's Department of Public Utilities. Committed to providing safe, reliable water to its customers, Portsmouth Department of Utilities solicited your support through water conservation and developed an additional water source.

# Citizen Response

With only 61 percent water capacity remaining in our lakes, Portsmouth's Interim City Manager C. W. "Luke" McCoy ordered mandatory water conservation on July 10, 2002. You, our customers, responded by reducing water consumption by 12 percent during the second half of the year! Your efforts were important in preserving Portsmouth's water resources. As a direct result of your conservation, the lake water level only fell another seven percent before much-needed rains returned in the late fall and early winter of 2002 bringing reservoir levels up to normal.



**A new water supply** While residence were implementing ways to conserve and reuse water, the City of Portsmouth initiated the emergency design and construction of a pipeline to provide additional high quality raw water to the city's reservoirs during times of need. With the support and cooperation of top officials from the State of Virginia, the cities of Norfolk and Suffolk as well as the Virginia Departments of Transportation and Health, this project was completed in record time and now stands ready to supplement Portsmouth's lakes should drought conditions return.

**Looking to the Future** Population growth, urban development and possible drought conditions will continue to be issues of concern for the Portsmouth Department of Utilities. We ask for your continued support and participation in water conservation, and the protection and enhancement of our waterways.

If you are interested in learning more about the decisions that affect the reliability and quality of your drinking water, please contact the City Clerk at (757) 393-8639 to obtain a schedule of when water utility issues will be brought before the City Council.





**PORTSMOUTH'S WATER TREATMENT FACILITY** has the capacity to treat 33 million gallons of water each day and serves over 120,000 customers in Portsmouth, Chesapeake and Suffolk. Source water comes from both surface lakes and deep wells. The Hampton Roads Planning District Commission conducted a Source Water Assessment of Portsmouth's waterworks in 2000/2001. Our surface water sources, by definition, were rated as relatively high in susceptibility, while our deep wells were rated as low in susceptibility to contamination using the criteria developed by the state in its approved Source Water Assessment Program.

**About source water prior to treatment:** The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, 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.

In order to ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

#### Contaminants that may be present in source water include:

- **Microbial contaminants**, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants**, such as salts and metals, that can be naturally occurring or result from urban storm-water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- **Pesticides and herbicides** that may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses.
- **Organic chemical contaminants**, including synthetic and volatile organic chemicals, that are by-products of industrial processes and petroleum production and can also come from gas stations, urban stormwater runoff, and septic systems.
- **Radioactive contaminants** that can be naturally occurring or the result of oil and gas production and mining activities.
- **Cryptosporidium** is a microbial organism. When ingested, it can cause diarrhea, fever, and other gastrointestinal symptoms. This organism is found in animal wastes and sewage and is washed into rivers and streams when it rains. The best defense against this organism is an effective treatment process, most importantly filtration. Portsmouth's triple-media filters are successfully removing tiny particles, including particles the same size as these organisms, from our water. We believe that new upgrades to our filtration and treatment process will enable us to achieve even greater particle removal, and thus greater protection from Cryptosporidium.

#### A word about drinking water...

**1** 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 water poses a health risk. More information about contaminants and potential health effects can be obtained by calling EPA's Safe Drinking Water Hotline (1-800-426-4791).

**2** 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 people, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from EPA's Safe Drinking Water Hotline (1-800-426-4791).

# Definitions

**Maximum Contaminant Level Goal or MCLG:** 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.

**Maximum Contaminant Level or MCL:** 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.

**Maximum Residual Disinfectant Level or MRDL:** The highest level of disinfectant allowed by the EPA, calculated as a running quarterly average of monthly samples.

**Treatment Technique or TT:** A required process intended to reduce the level of a contaminant in drinking water.

**Action Level or AL:** The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.

**ppm** = concentration in parts per million, or milligrams per liter (mg/L); this is equivalent to 1¢ in \$10,000

**ppb** = concentration in parts per billion, or micrograms per liter (µg/L); this is equivalent to 1¢ in \$10,000,000

**ppt** = concentration in parts per trillion; this is equivalent to 1¢ in \$10,000,000,000

**pCi/L** = picocuries per liter; a measure of radioactivity

**N/A** = Not Applicable

**NLE** = No Level Established

**NGE** = No Goal Established

**NTU** = Nephelometric Turbidity Units; units describing how cloudy a water sample appears

**<** = less than; when seen in a table, it usually refers to below detectable levels

**Contaminant:** Anything found in water (including microorganisms, minerals, chemicals, radionuclides, etc.) that may be harmful to human health.

**Raw Water:** Water in its natural state, prior to any treatment for drinking.

**Source Water:** Water in its natural state, originating from the watershed that supplies a water system with its raw water.

**Watershed:** The land area from which water drains into a stream, river, or reservoir.

**Treated Water:** Water to be used by a public water system that has received the application of approved water treatment chemicals.

**Drinking Water:** Water that has been treated to comply with EPA regulations and is pumped to water customers for their use.

# Water Quality Table - 2002 Data

| Regulated Parameters   | Concentration Units | EPA Goal MCLG | EPA Limit MCL                                       | Portsmouth's Concentration Level | Typical Sources   | Notes Health Effects   |   |
|--|---------------------|---------------|---|----------------------------------|---|--|---|
| <b>Microbial Contaminants</b>  |                     |               |   |                                  |   |  |   |
| Total Coliform Bacteria  | --                  | 0             | Presents of coliform bacteria in <5% of mo. samples | 3%                               | Normally present in the environment.  | This value represents the highest monthly percentage of positive samples during 2002. A minimum of 100 samples are taken each mo.  |   |
| Turbidity  | NTU                 | N/A           | TT  | 0.2                              | Soil runoff   | 100% of samples taken met turbidity limits.  |   |
| <b>Radioactive Contaminants (1999 Data)</b>                            |                     |               |   |                                  |   |  |   |
| Beta/Photon emitters   | PC/L                | 0             | 50  | 3.9                              | Decay of natural and manmade deposits.  | The MCL for Beta particles is 4mrem per year. EPA considers 50pCi/L to be the level of concern for beta particles. 1999 data See Note 1  |   |
| <b>Inorganic Contaminants</b>  |                     |               |   |                                  |   |  |   |
| Antimony   | ppb                 | 6             | 6   | <2                               | Discard from petroleum refineries; fire retardants; ceramics; electronics; solder   |  |   |
| Arsenic  | ppb                 | N/A           | 50  | <2                               | Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production waste.                              |  |   |
| Barium   | ppm                 | 2             | 2   | <0.2                             | Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits  |  |   |
| Beryllium  | ppb                 | 4             | 4   | <2                               | Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries            |  |   |
| Cadmium  | ppb                 | 5             | 5   | <2                               | Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints |  |   |
| Chromium   | ppb                 | 100           | 100   | <10                              | Discharge from steel and pulp mills; erosion of natural deposits  |  |   |
| Copper   | ppm                 | 1.3           | AL=1.3  | .21                              | Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives                              | Zero of 69 samples taken exceeded Action Level Portsmouth's concentration range is <.01 - .33 2000 data See Note 1   |   |
| Cyanide  | ppb                 | 200           | 200   | <10                              | Discharge from steel/metal factories; discharge from plastic and fertilizer factories   |  |   |
| Fluoride   | ppm                 | 4             | 4   | 1.34                             | Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories            |  |   |
| Lead   | ppb                 | 0             | AL = 15   | <1                               | Corrosion of household plumbing systems; erosion of natural deposits  | One of 69 samples taken exceeded Action Level. Portsmouth's concentration range is <1 - 9. 2000 data See Note 1  |   |
| Selenium   | ppb                 | 50            | 50  | <10                              | Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines                                    |  |   |
| Thallium   | ppb                 | 0.5           | 2   | <2                               | Leaching from ore-processing sites; discharge from electronics, glass, and drug factories   |  |   |
| <b>Synthetic Organic Compounds</b>                                     |                     |               |   |                                  |   |  |   |
| Atrazine   | ppb                 | 3             | 3   | .1                               | Runoff from herbicide use on row crops  | Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties. |   |
| <b>Disinfectant</b>  |                     |               |   |                                  |   |  |   |
| Regulated Parameters   | Concentration Units | EPA Goal MCLG | EPA MRDL  | Portsmouth's Concentration Level | Portsmouth's Concentration Range  | Typical Sources  | Notes Health Effects  |
| Total Chlorine   | ppm                 | N/A           | 4.0   | 2.86                             | 1.0 - 4.0   | Used as a disinfectant in drinking water treatment   |   |
| Regulated Parameters   | Concentration Units | EPA Goal MCLG | EPA Limit MCL                                       | Portsmouth's Concentration Level | Portsmouth's Concentration Range  | Typical Sources  | Notes Health Effects  |
| <b>Disinfection By-Products and Precursor Compounds</b>                |                     |               |   |                                  |   |  |   |
| TTHMs  | ppb                 | N/A           | 80  | 64                               | 41-65   | By-product of drinking water chlorination  | Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer |
| HAA5   | ppb                 | N/A           | 60  | 44                               | 27-51   | By-product of drinking water chlorination  | Some people who drink water containing haloacetic acids in excess of the MCL over many years may experience an increased risk of cancer   |
| TOC (See Note 4)   | mg/l                | NA            | TT  | 1.7                              | 1.15 - 2.34   | Naturally present in the environment   |   |
| <b>Information Collection Rule (ICR) Parameters (See Note 2 Below)</b> |                     |               |   |                                  |   |  |   |
| Giardia  | Total Cysts         | NGE           | NLE   | 8                                | 6-8   | Human and animal fecal waste   | Only two occurrences above the analytical detection limit were observed in the source water prior to treatment.   |
| THM4   | ug/L                | NGE           | NLE   | 46                               | 19-46   | By-product of drinking water chlorination  |   |
| HAAS   | ug/L                | NGE           | NLE   | 81                               | 37-81   | By-product of drinking water chlorination  |   |
| HAN  | ug/L                | NGE           | NLE   | 7                                | 5-7   | By-product of drinking water chlorination  |   |
| HK   | ug/L                | NGE           | NLE   | 7                                | 3-7   | By-product of drinking water chlorination  |   |
| CP   | ug/L                | NGE           | NLE   | 1                                | 0-1   | By-product of drinking water chlorination  |   |
| CH   | ug/L                | NGE           | NLE   | 11                               | 2-11  | By-product of drinking water chlorination  |   |
| TOX  | ug/L                | NGE           | NLE   | 284                              | 123-284   | By-product of drinking water chlorination  |   |
| Residual Chlorine  | mg/L                | NGE           | NLE   | 6                                | 2-6   | By-product of drinking water chlorination  |   |

Note 1: The Virginia Department of Health has granted reduced monitoring for these elements because of historically low levels.

Note 2: ICR Parameters represent 1998 data.

Note 3: Pursuant to the Environmental Protection Agency's Unregulated Contaminant Monitoring Rule the City of Portsmouth monitored for unregulated contaminants in 2001. Questions concerning the results of this monitoring should be directed to the Water Quality Specialist at (757) 539-2201 X240.

Note 4: Though TOC is measured in ppm (parts per million) Portsmouth's Concentration Level and Range are reported as ratios. Any number greater than 1 indicates compliance.

| Non-Regulated Parameters                   | Concentration Units | Portsmouth's Concentration Level | Typical Sources  |
|--|---------------------|----------------------------------|--|
| <b>Additional Water Quality Parameters</b> |                     |                                  |  |
| Aluminium                                  | ppb                 | <200                             |  |
| Iron                                       | ppb                 | <200                             | Erosion of natural deposits; leaching from pipes; residual of drinking water treatment process |
| Manganese                                  | ppb                 | <10                              | Erosion of natural deposits; by-product of drinking water treatment process                    |
| Sodium                                     | ppm                 | 72.8                             |  |
| pH   | --                  | 7.37                             |  |
| Alkalinity                                 | ppm                 | 114                              | Erosion of natural deposits  |
| Chloride                                   | ppm                 | 20.4                             | Erosion of natural deposits  |
| Corrosion Index                            | --                  | 10.68                            |  |
| Calcium Hardness                           | ppm                 | 17.8                             |  |
| Hardness - Total                           | ppm                 | 21.6                             | Erosion of natural deposits  |



At the City of Portsmouth Department of Public utilities, we value our customers and work hard to ensure your satisfaction. If you have questions or comments about this report or other issues concerning water quality, please call us or the other sources of water quality information listed below:

City of Portsmouth  
Water Quality Division  
(757) 539-2201 X240

Additional sources of information regarding water quality may be found at:

Virginia Department of Health  
Office of Water Programs  
(757) 363-3876

U.S. Environmental Protection Agency  
Safe Drinking Water Hotline  
1-(800) 426-4791

This Water Quality Report as well as other City issues can also be viewed at our Web site. Please visit us at:

<http://www.portsmouth.va.us>