

DATE: June 25, 2001

TO: DWSE Staff

THROUGH: Robert W. Hicks, Director
Office of Environmental Health Services

Robert B. Taylor, P.E., Director
Division of Water Supply Engineering

FROM: G. W. Peaks, P.E., Technical Services Administrator
Division of Water Supply Engineering

SUBJECT: Water – Procedure – Enforcement - Boil Water Notices

Delete WM 734

Reference WM 726

VIRGINIA DEPARTMENT OF HEALTH DIVISION OF WATER SUPPLY ENGINEERING (DWSE)

GUIDELINES FOR THE ISSUANCE OF BOIL WATER NOTICES

I. AUTHORITY AND INTENT

The *Code of Virginia*, Title 32.1, Article 2 Public Water Supplies in §32.1-169. Supervision by Board-“The Board shall have general supervision and control over all water supplies and waterworks in the Commonwealth insofar as the bacteriological, chemical, radiological and physical quality of waters furnished for drinking or domestic use may affect the public health and may require that all water supplies be pure water.”

§32.1-167 states “Pure Water” means water fit for human consumption and domestic use (i) which is sanitary and normally free of minerals, organic substances and toxic agents in excess of reasonable amounts and (ii) which is adequate in quantity and quality for the minimum health requirements of the persons served.

Other related references from the *Code* and the *Waterworks Regulations* are:

§32.1-175 Emergency Orders of Commissioner
12VAC-5-590-40 Administration of Regulations
12VAC-5-590-360 Responsibility; owner
12VAC-5-590-540 Public Notification

Of major importance in providing pure water is the inactivation of microbiological contaminants of waterborne origin. Through natural and manmade means, Virginia’s citizens and visitors may be subjected to microbiological contaminants in their drinking water supply. Large outbreaks involving bacteria, viruses, and protozoa have occurred throughout the country, increasing awareness of these hazards.

This working memo will serve as a guideline regarding the issuance of boil water notices during instances of imminent or substantial threat of microbiological contamination. The VDH-DWSE and the local health departments, in coordination with the Commissioner, have the responsibility to ensure that boil water notices are

issued and rescinded appropriately, in a manner consistent with the degree of hazard encountered. Additionally, this document serves to outline particular instances when boil water notices shall be issued, the general wording and content of such notices, and the monitoring and clearance activities which must be conducted prior to rescinding notices.

These notices should be issued in a prudent manner and only when there is sufficient justification for such action and concurrence has been obtained from the DWSE Director and the local Medical Director.

Inordinate issuance of the notices will cause needless alarm and may result in the public paying less attention to future notices.

II. IMPLEMENTATION AND INTERDEPARTMENTAL COORDINATION

Under certain conditions that compromise the water quality as described below, or following verification of the presence of microbiological pathogens or their indicators within a waterworks, the waterworks shall notify the VDH-DWSE and/or the local health department. The VDH-DWSE field and central office will coordinate with the local health department, the Commissioner's staff, and the waterworks to determine immediate actions which are to be taken (including the issuance of a boil water notice) to minimize danger to the public. VDH will provide the waterworks with a draft notice to be distributed by the waterworks. Adequate communication between VDH and the waterworks is essential to ensure that everyone is fully informed prior to the issuance of a boil water notice. VDH may issue the notice if the waterworks owner fails to do so.

The waterworks may issue its own boil water notice using these guidelines if it determines it is necessary. However, the VDH shall be immediately notified in such a case and provided with a copy of the notice.

Issuance of boil water notices involving imminent threats to public health involving waterworks shall be documented with a Governor's Office Issue/Media form similar to Attachment A and B.

III. TYPES OF INCIDENTS

A. Microbiological Contamination.

1. A boil water notice shall be issued when multiple water samples indicate the presence of fecal coliform bacteria, *E. coli*, or waterborne pathogens. The presence of such indicates an acute threat to the public's health and warrants immediate action by the waterworks and VDH to alert consumers.
2. Filtered water (point of entry) turbidity levels exceeding 1.0 NTU in conjunction with any of the following factors warrant the issuance of a boil water notice. With the continuing threat of drinking water contamination via emerging microbial contaminants such as *Cryptosporidium*, waterworks utilizing surface water and/or groundwater under the direct influence of surface water as their source should monitor critical water process parameters. Abrupt changes in process parameters such as turbidity, particle counts, and disinfectant residuals may indicate a compromise in the water treatment process and a potential for increased microbial risk to consumers. Abrupt changes in the quality of the source water which cannot be accommodated by the existing treatment processes, a disruption in treatment processes, or the presence of pathogenic microbes in finished water are factors which should be considered in determining action to be taken.

B. Zero or Negative Pressure. A boil water notice shall be issued in cases where pressure in the water distribution system (or portions thereof) has been reduced to zero, or a negative pressure has occurred. Examples of such events include water treatment plant or pump station shut downs due to equipment failure, power outages, emptying of storage tanks, or draining of the system during fire events. Boil water notices covering properly isolated portions of the system may be considered.

- C. Low Water Pressures.** A drop in water pressure in a water distribution system is a signal of the existence of conditions which could allow contamination to enter the water system through backflow by back-pressure or back-siphonage. Water pressure falling below the regulated service level of 20 psi does not, in the absence of other aggravating factors, necessarily constitute an imminent health hazard. Boil water notices **may** be issued in such cases when there is a historical record of inadequate disinfectant maintenance in the water distribution system or excessive leakage, or analytical records indicate persistent microbiological or turbidity problems or an inadequate backflow prevention program exists. The decision to issue the boil water notice shall be made on a case by case basis and based upon professional judgment using all available data that may indicate the extent of the problem. Such data as type of facilities affected, the duration of the low pressure condition, and the possibility of infiltration into the waterworks should be considered.
- D. Major Water Main Breaks/Interruptions.** Boil water notices must be issued in cases of major water main breaks or planned distribution system interruptions which are deemed an imminent public health threat or which will affect the bacteriological quality of the drinking water unless the waterworks can demonstrate, by sound engineering judgment, that the integrity of the waterworks has been maintained. Assurance from the waterworks that an outflow of water has been continuously maintained and no nonpotable water, soil or other potentially contaminated material has entered, or may enter, the broken water main during the event, will serve to demonstrate that the integrity of the system has been maintained. In cases of **routine breaks with brief interruption** in service, the affected water main should be immediately repaired, flushed, disinfected, sampled, and monitored for chlorine residual according to ANSI/AWWA Standard C651-92. Even if these measures are taken, advisories (not boil water notices) should be considered if temporary changes in water quality are expected to occur.
- E. Flooding of Wells.** Boil water notices shall be issued where surface water inundation of a water supply well has occurred. The presence of disinfectant resistant strains of protozoa such as *Giardia* or *Cryptosporidium* warrant special precautions to be taken until the microbiological integrity of the waterworks is verified.

IV. ADDITIONAL PRECAUTIONS (where appropriate).

1. Microbiological and turbidity (as appropriate) samples shall be collected immediately within the area affected, and measures taken expeditiously to restore the integrity of the water system.
2. Disinfectant residuals through the system should be raised to ~ approximately 2.0 mg/l during the incident for systems that disinfect.
3. Flushing of system components is generally necessary; however, required minimum pipe flushing velocities may not be necessary. Consistent turbidity levels of less than 1.0 NTU in the distribution system must be obtained prior to rescinding the boil notice.
4. If the problem can be confined to a specific area or zone, the boil water notice can be limited to the affected area or zone. Confinement measures include physical disconnection or air gaps. Simply valving off a section is not considered appropriate backflow prevention.
5. During or even after an incident, concerned consumers should be advised that it is an individual decision whether to continue to boil their water or use bottled water. Caution may be the best policy.

V. CONTENT OF BOIL WATER NOTICES

The content of boil water notices shall include as a minimum the following information: name of the waterworks, geographical area affected, statement of the problem, date of occurrence, consumer corrective measures to be taken, and action being taken by the waterworks to correct the problem. A statement indicating how and when the notice will be lifted, and a telephone number directing consumer questions to an appropriate party within the waterworks shall also be included. Due to the wide variation in circumstances that could lead to the issuance of boil water notices, a one size fits all model is not feasible. The parties involved have considerable discretion in additional information included in the notice.

Note: The Centers for Disease Control (CDC) and the EPA have indicated that a rolling boil for a period of one minute is sufficient to render drinking water microbiologically safe, free of bacteria, viruses, and protozoa. (see Attachment C)

(SEE ATTACHMENTS D, E, F AND G FOR SAMPLE NOTICES and Transmittal Letters)

VI. DELIVERY METHODS FOR BOIL WATER NOTICES

The Boil Water Notices shall be delivered as follows:

- A. In a form and manner reasonably calculated to reach all person served as soon as practical but no later than 24 hours after the waterworks learns of the situation.
- B. In order to reach all persons served (residential, transient and nontransient), the waterworks is to use one or more of the following:
 - 1. Appropriate broadcast media (such as radio and television);
 - 2. Posting of the notice in conspicuous locations throughout the area served by the waterworks;
 - 3. Hand delivery of the notice to persons served by the waterworks;
 - or
 - 4. Another delivery method approved in writing by DWSE.
- C. In order to provide a spanish version, if appropriate, utilize the following:

“Until further notice, bring your water to a rolling boil for one minute before using for drinking, cooking or other consumptive uses.”

“Hasta nuevo aviso, haga hervir el agua durante un minuto antes de usarla para beber, cocinar o otros tipos de consumo.”

VII. RESCISSION OF BOIL WATER NOTICES

It shall be the responsibility of the entity issuing the boil water notice to rescind it. Receipt of a minimum of two consecutive days of satisfactory representative bacteriological sample results, supplemented by appropriate disinfection residual levels and other water quality parameters (including turbidity) indicating that the water is safe and the concurrence of the VDH is required. As is required during the issuance of such, all parties involved must be adequately informed of the rescission of the boil water notice.

(SEE ATTACHMENT H FOR SAMPLE RESCISSION NOTICE)

VIII. Further References.

- 1. *Cryptosporidium* and Water: A Public Health Handbook, Atlanta, Georgia: Working Group on Waterborne Cryptosporidiosis.
- 2. Interim Enhanced Surface Water Treatment Rule, pages 69481 and 69482, Public Health Concerns to be Addressed.
- 3. August 22, 1991 Memo from Robert B. Stroube (Attachment I)
- 4. Boil Water Notices, Answers to Frequently Asked Questions (Attachment J)
- 5. *Cryptosporidium* Fact Sheet (Attachment K)

HEALTH AND HUMAN RESOURCES
GOVERNOR'S OFFICE ISSUE/MEDIA ALERT # _____

| | | | | | | | | | | | | | |
|---|--|---------------------|---|---------------------|-------------------|---|-------------------|-----------------|---|-----------------|---------------|---|--------|
| <p>DATE: June 28, 2000</p> <p>AGENCY: Virginia Department of Health</p> <p>ISSUE TITLE: Fecal Coliforms in Burkeville Water</p> <p style="padding-left: 40px;">Contact: Nancy F. Winter 225-3626</p> | <p style="text-align: center;">ACTION SUMMARY:</p> <p>: URGENT</p> <p>Γ Routine</p> <p>Γ Governor's Office Action</p> <p>Γ Governor's Office Information</p> <p>Γ Potential Media Issue</p> <p>Γ Other: _____</p> | | | | | | | | | | | | |
| <p>ISSUE DESCRIPTION: Burkeville Waterworks in Nottoway County has confirmed the presence of fecal coliform contamination in their drinking water system from an undetermined source.</p> | | | | | | | | | | | | | |
| <p>BACKGROUND: The waterworks will be disinfecting and flushing their distribution system and collecting bacteriological samples.</p> | | | | | | | | | | | | | |
| <p>CURRENT SITUATION: The waterworks will issue a boil water notice on Thursday morning through the broadcast news media. The notice will last until the source contamination is found and eliminated, and the system has been demonstrated to be free of contaminated water. Health officials from the Danville Environmental Engineering Field Office are closely monitoring the situation.</p> | | | | | | | | | | | | | |
| <p>POTENTIAL IMPACT: None</p> | | | | | | | | | | | | | |
| <p>POTENTIAL EXTERNAL ORGANIZATION/MEDIA INTEREST:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">: Print Media:</td> <td style="width: 10%; text-align: center;">9</td> <td style="width: 60%;">Other State Agency:</td> </tr> <tr> <td>: TV/Radio Media:</td> <td style="text-align: center;">9</td> <td>Local Government:</td> </tr> <tr> <td>Γ Organization:</td> <td style="text-align: center;">9</td> <td>Federal Agency:</td> </tr> <tr> <td>Γ Legislator:</td> <td style="text-align: center;">9</td> <td>Other:</td> </tr> </table> | | : Print Media: | 9 | Other State Agency: | : TV/Radio Media: | 9 | Local Government: | Γ Organization: | 9 | Federal Agency: | Γ Legislator: | 9 | Other: |
| : Print Media: | 9 | Other State Agency: | | | | | | | | | | | |
| : TV/Radio Media: | 9 | Local Government: | | | | | | | | | | | |
| Γ Organization: | 9 | Federal Agency: | | | | | | | | | | | |
| Γ Legislator: | 9 | Other: | | | | | | | | | | | |
| <p>ACTION TO BE TAKEN BY AGENCY/SECRETARY: N/A</p> | | | | | | | | | | | | | |
| <p>RECOMMENDATIONS FOR GOVERNOR'S OFFICE ACTION (If necessary): N/A</p> | | | | | | | | | | | | | |

HEALTH AND HUMAN RESOURCES
GOVERNOR'S OFFICE ISSUE/MEDIA ALERT # _____

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|---|---|
| <p>DATE: July 24, 2000</p> <p>AGENCY: Virginia Department of Health Office of Water Programs Main Street Station 1500 East Main Street, Room 109 Richmond VA 23219</p> <p>ISSUE TITLE: Lawrenceville Water Treatment Plant Flooding</p> <p>Contact: Robert B. Taylor, P.E., Director, Division of Water Supply Engineering</p> | <p style="text-align: center;">ACTION SUMMARY:</p> <p><input type="checkbox"/> URGENT</p> <p><input type="checkbox"/> Routine</p> <p><input type="checkbox"/> Governor's Office Action</p> <p><input type="checkbox"/> Governor's Office Information</p> <p><input type="checkbox"/> Potential Media Issue</p> <p><input type="checkbox"/> Other: _____</p> |
| <p>ISSUE DESCRIPTION: Heavy localized rains in Brunswick County caused flooding of the Lawrenceville Water Treatment Plant.</p> | |
| <p>BACKGROUND (Note relevant actions, dates, and requirements): The Town of Lawrenceville's Water Treatment Plant Operator contacted the Danville Field Office (DFO) by phone on Monday, 7/24/00, to advise that the plant had flooded due to heavy rains.</p> | |
| <p>CURRENT SITUATION: The sedimentation basin and the clearwell were reportedly flooded. The water treatment plant is currently out of service while personnel work to clean up and disinfect the clearwell in preparation for return to operation. The Town has less than one day of water distribution storage available for use while the plant is down. Representatives from the DFO are on-site providing technical assistance.</p> | |
| <p>POTENTIAL IMPACT(Note cost to agency, potential litigation): NA</p> | |
| <p>POTENTIAL EXTERNAL ORGANIZATION/MEDIA INTEREST (Check categories and specify):</p> <p><input type="checkbox"/> Print Media: _____ 9 Other State Agency: _____</p> <p><input type="checkbox"/> TV/Radio Media: _____ : Local Government: <u>Lawrenceville, Brunswick County</u></p> <p><input type="checkbox"/> Organization: _____ 9 Federal Agency: _____</p> <p><input type="checkbox"/> Legislator: _____ 9 Other: _____</p> | |
| <p>ACTION TO BE TAKEN BY AGENCY/SECRETARY: None</p> | |
| <p>RECOMMENDATIONS FOR GOVERNOR'S OFFICE ACTION (If necessary): N/A</p> | |

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 13, 1994

Office of Water

MEMORANDUM

SUBJECT: Boiling Water Time for Killing Pathogens
FROM: James R. Elder, Director
Office of Ground Water and Drinking Water
TO: Drinking Water Branch Chiefs, Regions I-X

I am attached an article from the Morbidity and Mortality Weekly Report (September 16, 1994) on the boil water advisory issued during December 1993 for Washington, DC. The last paragraph of this article includes a joint EPA/Centers for Disease Control policy statement on how long individuals should boil their water when a water system issues a boil water notice.

The statement recommends that individuals bring their water to a rolling boil for one minute. This will kill all known waterborne pathogens, including Giardia and Cryptosporidium. Because the boiling point is lower at higher altitudes, and thermal death information is not complete for all waterborne viruses, the policy statement recommends that individuals at elevations above 2 kilometers (6562 feet) boil their water for three minutes as a precaution.

Please convey this information to your States.

Attachment

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

EPIDEMIOLOGIC NOTES AND REPORTS

**Assessment of Inadequately Filtered Public Drinking Water --
Washington, D.C., December 1993**

The risk for waterborne infectious diseases increases when filtration and other standard water-treatment measures fail. On December 6, 1993, water-treatment plant operators in the District of Columbia (DC) began to have difficulty maintaining optimal filter effectiveness. On December 7, filter performance worsened, and levels of turbidity (i.e., small suspended particles) exceeded those permitted by U.S. Environmental Protection Agency (EPA) standards. On December 8, DC residents were advised to boil water intended for drinking because of high municipal water turbidity that may have included microbial contaminants. Although adequate chlorination of the DC municipal water was maintained throughout the period of increased turbidity, the parasite *Cryptosporidium parvum* is highly resistant to chlorination. Because of the increased risk for infection with this organism and other enteric pathogens, the DC Commission of Public Health and CDC conducted four investigations to determine whether excess cases of diarrheal illness occurred because residents drank inadequately filtered water. This report describes the results of these investigations.

The investigations included a random-digit-dialed telephone survey of DC residents and retrospective reviews of records from two emergency departments, two nursing homes, and seven hospital microbiology laboratories. The occurrence of diarrheal illness or presence of organisms in stool during the 2 weeks before the turbidity violation (period 1: November 22-December 5) was compared with that during the 2-3 weeks after the violation was first noted (period 2: December 6-December 21 or 26). The incubation period for cryptosporidiosis typically ranges from 2 to 14 days.

Telephone Survey. The telephone survey samples 1197 household members (0.2% of DC's 6000,000 residents) from 462 households in all 22 DC residential ZIP code areas. The percentage of persons who reported having diarrhea (i.e., three or more loose or watery stools in a 24-hour period) were similar for period 1 (the reference period) and period 2 (2.8% versus 3.5%, respectively; relative risk [RR] = 1.2; 95% confidence interval [CI] = 0.8-1.9). A total of 37% of persons reported that bottled water was their principal source of drinking water at home, and 30% reported that bottled water was

.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES / Public Health Service Working

Drinking Water - Continued

Because *Cryptosporidium* is highly resistant to chlorination, disinfection of water is not a reliable method of preventing exposure to it. The failure to detect increased rates of illness among residents of DC probably reflects the absence of, or presence of only a small number of, oocysts in the water that supplied the municipal water-treatment plant at the time the filtration failure occurred. In addition, the investigations in DC did not detect any increase in diarrheal illness associated with the elevated water turbidity; however, the sample sizes in these investigations were too small to rule out low-level transmission of waterborne agents. For example, the telephone survey probably would not have detected an outbreak affecting fewer than 12,000 persons.

Cryptosporidium is present in 65%-87% of surface water samples tested throughout the United States (2,3). However, because current techniques to detect *Cryptosporidium* in water are cumbersome, costly, and insensitive, tests to detect it are not routinely performed by water utilities. During 1995, EPA plans to collect additional information about *Cryptosporidium* and other microorganisms in surface water used by municipal water-treatment methods for removing them. §

The early detection of waterborne outbreaks of cryptosporidiosis is difficult for at least four reasons: 1) many physicians are unaware the *Cryptosporidium* can cause watery diarrhea; 2) the symptom complex often resembles a viral syndrome; 3) clinical laboratories often do not routinely test for *Cryptosporidium* when a physician requests a stool examination for ova and parasites; and 4) few states include cryptosporidiosis as a reportable disease.

Variations in recommendations regarding the duration of boiling during boil-water advisories have reflected uncertainty about how long some organisms can survive. On the basis of a recent literature review, CDC and EPA recommend that water be rendered microbiologically safe for drinking by bringing it to a rolling boil for 1 minute; this will inactivate all major waterborne bacterial pathogens (i.e., *Vibrio cholerae*, enterotoxigenic *Escherichia coli*, *Salmonella*, *Shigella sonnei*, *Campylobacter jejuni*, *Yersinia enterocolitica*, and *Legionella pneumophila*) and waterborne protozoa (e.g., *Cryptosporidium parvum*, *Giardia lamblia*, and *Entamoeba histolytica* [4-7]). Although information about thermal inactivation is incomplete for waterborne viral pathogens, hepatitis A virus -- considered one of the more heat-resistant waterborne viruses (8)--also is rendered noninfectious by boiling for 1 minute (9). If viral pathogens are suspected in drinking water in communities at elevations above 6562 ft. (2 km), the boiling time should be extended to 3 minutes.

References

1. Mac Kenzie WR, Hoxie NJ, Proctor ME, et al. A massive outbreak in Milwaukee of *Cryptosporidium* infection transmitted through a public water supply. *N Engl J Med* 1994;331:161-7.
2. Rose JB, Gerba CP, Jakubowski W. Survey of potable water supplies for *Cryptosporidium* and *Giardia*. *Environmental Science and Technology* 1991;25:1393-400.
3. LeChevallier MW, Norton WD, Lee RG. Occurrence of *Giardia* and *Cryptosporidium* spp. in surface water supplies. *Appl Environ Microbiol* 1991;57:2610-6.
1. Bandres JC, MathewsonJJ, Dupont HL. Heat susceptibility of bacterial enteropathogens. *Arch Intern Med* 1988;148:2261-3.

SUBJECT: Fairfax County
Water - Lazy Susan Inn
PWS ID No. 6059556

Mr. Glen Gates
Lazy Susan Inn
Drawer Q
Woodbridge, VA 22194

Dear Mr. Gates:

This letter is in reference to the current bacteriological quality of the Lazy Susan Inn water system. According to our records, for the month of May 2000, total coliforms were detected in 1 routine sample. No repeat samples were taken during the month of May 2000. For the month of June 2000, fecal coliforms (or E. coli) were detected in 1 routine sample.

Based on the information provided above, it appears that this system may be in violation of State regulations and subject to receipt of either a Non-Acute or an Acute PMCL violation, depending on the repeat sample results scheduled to be collected on July 1, 2000.

We believe this is a serious health concern requiring the immediate posting of a boil water notice (see attached) to remain in place until further notice.

If you have any questions please contact me at 540-829-7340.

Sincerely,

Hamid R. Golesorkhi
District Engineer

SC/jdc

CC: Fairfax County Health Department
Fairfax County Executive
OWP – Central (Division of Water Supply Engineering)
Fairfax County HD; Attn: Gary Haines, EH (senior)

S:/dist8/fx/Lazy Susan Inn Boil notice Jun

**NOTICE TO CUSTOMERS
OF THE**

Lazy Susan Inn

WATER SYSTEM

In keeping with National Primary Drinking Water Regulations, we are obliged to inform you that we may be in violation of federal regulations because drinking water being served to our customers in the Lazy Susan Inn system did not comply with the Primary Maximum Contaminant Level for coliform bacteria during June 2000. The determination of the type of violation (Non-Acute or Acute) will be made following the collection of additional samples.

The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of fecal coliforms or E. coli is a serious health concern. Fecal coliforms and E. coli are generally not harmful themselves, but their presence in drinking water is serious because they usually are associated with sewage or animal wastes. The presence of these bacteria in drinking water is generally a result of a problem with water treatment or the pipes which distribute the water, and indicates that the water may be contaminated with organisms that cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and associated headaches and fatigue. The symptoms, however, are not just associated with disease-causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. EPA has set an enforceable drinking water standard for fecal coliforms and E. coli to reduce the risk of these adverse health effects. Under this standard, all drinking water samples must be free of these bacteria. Drinking water which meets this standard is associated with little or none of this risk and should be considered safe. State and local health authorities recommend that consumers take the following precautions:

**ALL WATER USED FOR DRINKING AND COOKING SHOULD BE BROUGHT
TO A FULL ROLLING BOIL FOR 1 MINUTE BEFORE USE. THIS SHOULD
CONTINUE UNTIL FURTHER NOTICE.**

A total of 6 samples were taken in the Lazy Susan Inn water system during May and June 2000. One (1) was positive for total coliform bacteria and I was positive for fecal coliform/E. coli bacteria. A third result out of these six (6) samples is currently pending laboratory analysis. Additional samples are being taken to evaluate the seriousness and extent of the problem.

We will attempt to prevent further violations by collecting all of the required samples, carefully reviewing the results, and promptly taking appropriate corrective action after consulting with State health officials. Further violations, however minor, will be reported to you as part of Federal and State waterworks regulations aimed at increasing consumer awareness of conditions that exist in public water systems.

Sincerely,

(WATERWORKS OWNER'S SIGNATURE)

November 30, 2000

Subject: City of Martinsville
Water – Martinsville Waterworks

BOIL WATER NOTICE

Mr. Earl B. Reynolds, Jr., City Manager
City of Martinsville
P.O. Drawer 1112
Martinsville, VA 24114

Dear Mr. Reynolds:

Due to a compromise in the ability of the Martinsville Water Treatment Plant to meet normal operating standards for turbidity removal, we are advising you to issue a boil water notice to all consumers of the water from the Martinsville waterworks. This boil water notice is a precautionary measure, as bacteriological water quality may be compromised. The notice should be distributed by the fastest means available, including area radio and TV stations. Other means such as posting and hand distribution may be appropriate for some customers. Commercially bottled drinking water may also be used as an alternative to boiling tap water. Attached is a copy of the basic Boil Water Notice, along with a question and answer flyer on Boil Water Notices.

The boiled water notice will be terminated as soon as water treatment operations return to normal and the water in the distribution system has been shown to be of satisfactory quality.

Sincerely,

John I Capito, P.E.
Engineer Field Director

JIC:jk
Enclosures

cc: Robert B. Taylor, P.E., DWE
Elizabeth W. Roycroft, M.D., Director, West Piedmont Health District



NOTICE

CITY OF MARTINSVILLE

Bring this water to a rolling boil for one minute before using it for drinking or food preparation.

The Martinsville water treatment facility is experiencing difficulty in producing water of normal high quality. The turbidity (very fine particles) in the water is exceeding normal operating standards. The bacteriological quality of the water may be compromised. This boil water notice is precautionary, as actual bacteriological contamination in the distribution system has not been confirmed.

Date Posted: November 30, 2000

By: City of Martinsville

By: Virginia Department of Health – Office of Water Programs





NOTICE

**DO NOT DRINK THE WATER
FROM THIS
FOUNTAIN/SPIGOT**

Date Posted: November 30, 2000

By: City of Martinsville

By: Virginia Department of Health – Office of Water Programs



29 June 2000

NOTICE OF VIOLATION

BOIL WATER NOTICE

Subject: Nottoway County
Water – Town of Burkeville
PWS ID No. 5135110

The Honorable Raymond George, Mayor
Town of Burkeville
114 South Agnew Street
Burkeville, Virginia 23922

Dear Mayor George:

This notice is to advise that you may be in violation of Section 12 VAC 5-590-380 of the *Waterworks Regulations* for exceeding the acute bacteriological water quality standard. Our records indicate that one sample collected during the month of June 2000 showed the presence of fecal coliform bacteria, and three of the four repeat samples confirmed the presence of fecal coliform bacteria.

The presence of fecal coliform in drinking water is a serious health concern. Under state regulations, the presence of fecal coliform in a routine sample followed by a positive fecal coliform repeat analysis constitutes an acute bacteriological violation. Also, because of the nature of this violation, a Boil Water Notice is being issued.

Section 12 VAC 5-590-540 of the *Waterworks Regulations* requires waterworks owners to notify consumers when the acute bacteriological standard is exceeded. As soon as possible but no later than 72 hours of receipt of this letter, you must provide a public notice to all area television and radio stations. In addition, you must publish a notice in a daily newspaper of general circulation within 14 days of receipt of this letter. If no daily newspaper is available, a weekly newspaper must be used. Also, you must mail or directly deliver a copy of a notice to customers within 45 days of receipt of this notice.

We have attached a draft notice for your use containing mandatory health effects language. Changes to the enclosed draft notice may be made; however, any such changes must be approved by the Office of Water Programs prior to distribution.

NOTICE TO CONSUMERS

BOIL WATER NOTICE

TOWN OF BURKEVILLE

PWSID NO. 5135110

State Health Officials have advised that the water supplied by this waterworks during the month of June 2000 exceeded the Primary Maximum Contaminant Level for bacteriological quality set by the Commonwealth of Virginia *Waterworks Regulations*. During this month, one routine sample was collected which indicated the presence of fecal coliform bacteria, and three of four repeat samples confirmed the presence of fecal coliform bacteria.

The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of fecal coliforms is a serious health concern. Fecal coliforms are generally not harmful themselves, but their presence in drinking water is serious because they usually are associated with sewage or animal wastes. The presence of these bacteria in drinking water is generally a result of a problem with water treatment or the pipes which distribute the water, and indicates that the water may be contaminated with organisms that can cause bacteria. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and associated headaches and fatigue. These symptoms, however, are not just associated with disease causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. EPA has set an enforceable drinking water standard for total and fecal coliforms to reduce the risk of these adverse health effects. Under this standard, drinking water samples must be free of the confirmed presence of these bacteria. Drinking water which meets this standard is associated with little or none of this risk and should be considered safe.

The Department of Health is advising that all water used for human consumption be boiled at least one minute. You will be advised when the water is again safe.

We will report further compliance notices to you as required by the Commonwealth of Virginia *Waterworks Regulations*. These notices are aimed at increasing the awareness by consumers of conditions that exist in public waterworks.

Signature of Owner

Date

Telephone No. _____

N O T I C E

**BOIL YOUR DRINKING WATER
TO THE CONSUMERS
OF THE
ABC WATER COMPANY**

State health officials feel there is a need for concern about the safety of your water. The well serving this waterworks is under the direct influence of surface water. Surface water found in a well indicates the natural purification process of the water filtering through soil has been bypassed. The existing treatment provided, chlorination, cannot adequately treat the well water for human consumption. Therefore,

**UNTIL FURTHER NOTICE, BRING YOUR WATER TO A ROLLING BOIL
FOR ONE MINUTE BEFORE CONSUMPTION OR USE.**

Boiled water should be used for drinking (this includes water used to make beverages such as coffee, tea, Kool-Aid, juice drinks, etc.), making ice, brushing teeth, washing dishes and food preparation. Boiling the water kills disease causing bacteria and other organisms in the water.

Water does not need to be boiled to wash clothes, bathing or showering. However, caution should be taken not to allow small children or infants to drink bath water or allow it to get into their mouths.

**USING WATER FOR CONSUMPTION PURPOSES FROM UNAPPROVED
WATER SOURCES OF UNTESTED AND UNKNOWN QUALITY
MAY POSE A THREAT TO YOUR HEALTH.**

Fecal coliforms were detected in the well raw water during the months of August and September 2000. Raw water is the water before it is chlorinated. Fecal coliforms are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems. The above symptoms are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care providers.

Until the situation is resolved we will be increasing the free available chlorine residual within the distribution system and increasing the number of monthly bacteriological samples collected from the distribution system. In addition, we are in the process of drilling a new well and plan to have it in service by December 2000.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

You will be notified of any future developments.

For additional information please contact:
Mr. Harry Jones, ABC Water Company
123 Anywhere Street, Nowhere, USA 11111
999-123-4567

Attachment H

(DATE)

RESCISSION OF BOIL WATER NOTICE

TO: RESIDENTS OF (NAME OF CITY, TOWN, MOBILE HOME PARK,
SUBDIVISION OR
COUNTY) LIVING IN THE AREA BOUNDED BY (STREET, AVENUE, CANAL
OR OTHER
DESCRIPTIVE BOUNDARY)

THE (DATE) "BOIL WATER NOTICE" IS HEREBY RESCINDED FOLLOWING
THE (ACTION TAKEN TO CORRECT THE PROBLEM) AND THE SATISFACTORY
COMPLETION OF THE BACTERIOLOGICAL SURVEY SHOWING THAT THE WATER
IS SAFE TO DRINK.

IF YOU HAVE ANY QUESTIONS, PLEASE CALL (NAME AT WATERWORKS)
AT (PHONE NUMBER).

(SIGNATURE) (NAME, TITLE OF OFFICIAL RESCINDING THE NOTICE)

August 22, 1991

MEMORANDUM

TO: Regional Directors
Regional Sanitarians
District Directors
District Sanitarian Managers
Local Health Departments

FROM: Robert B. Stroube, M.D., M.P.H.
Deputy Commissioner for Community Health Services

SUBJECT: Boil Water Notices
Policy and Procedures

All local health departments are to immediately implement the following policy and procedures for health department regulated establishments under a BOIL WATER NOTICE.

1. Develop a list of regulated establishments under a BOIL WATER NOTICE, including restaurants, hotels, campgrounds, summer camps, migrant labor camps, etc. Hospitals and nursing homes should be referred to the Division of Licensure and Certification, (804) 367-2100, unless there are areas that serve food to the public.
2. Send a certified letter to each regulated establishment under a BOIL WATER NOTICE (sample letter attached).
3. Enforcement procedures should be utilized if the establishment is not following the procedures outlined in the certified letter. This may include the immediate suspension of the health permit under the section of SUBSTANTIAL AND IMMINENT HEALTH HAZARD of the **Food Service Enforcement Procedures**, July 24, 1990 for restaurants. Establishments other than restaurants should follow enforcement procedures according to the specific regulation they fall under.

4. Enforcement of this policy should take place on the next routine establishment inspection. Any establishment under a BOIL WATER NOTICE should be debited or marked on the establishment inspection sheet as an unsafe water source by the local sanitarian.

5. Any establishment that wants to install a non-community well system in lieu of following the policy and procedures, should make application to the local health department and follow the implementation manual procedures. In the interim, the establishment should follow the procedures outlined below and in the certified letter.

IMPLEMENTATION PROCEDURES FOR ESTABLISHMENTS
UNDER A BOIL WATER NOTICE

A. DRINKING WATER

All drinking water should be boiled or as otherwise approved below.

Disconnect all drinking water fountains.

Provide bottled water from an approved source. Packaging, handling, storage and dispensing of bottled water should be protected from contamination.

Any bulk water transported to the establishment should be transported in approved bulk water transport and should be delivered to an approved closed-water system. This bulk water should be from an approved supply that is not under a BOIL WATER NOTICE. Additional chlorine should be added to the transported water at a dosing rate of 1 to 2 mg/l and the chlorine residual should be tested at the point of delivery before the transported water is put into service.

Fountain drinks that are connected to any water lines are prohibited. Only pre-mix canisters or similar bag-in-a-box syrup containers should be connected to fountain drink dispensing.

Post BOIL WATER NOTICE (See attachment) in all areas of the establishment where a water faucet is made available to the public.

B. ICE MANUFACTURING AND USE

Disconnect all ice manufacturing machines in the affected establishment.

All ice used during the BOIL WATER NOTICE should be from approved sources. These sources should be approved by the Virginia Department of Agriculture and Consumer Services, which regulates ice manufacturing in the Commonwealth.

All ice should be packaged, transported, handled, stored, dispensed, and protected to prevent contamination.

C. HANDWASHING

Establishments under a BOIL WATER NOTICE may use water for handwashing. Before handling food, single use plastic gloves may be utilized.

Employees of a food service establishment should regularly wash their hands as required in the Rules and Regulations Governing Restaurants. Hands should be thoroughly dried by single use towels or air drying.

Where handwashing facilities are provided for the public, hand soap and single use towels should be provided. Handwashing signs are available from the Division of Sanitarian Services for posting.

D. **BATHING AND PERSONAL HYGIENE**

Establishments under a BOIL WATER NOTICE may use water to flush toilets.

There is no need to boil bath or shower water. Instructions should be posted that care should be taken to make sure that children do not drink the water or get the water in their mouths during bathing.

There is no need to boil water to launder clothing or linens.

Only boiled water or bottled water should be used to brush teeth.

E. **FOOD PREPARATION AND COOKING**

All water used in cooking should be boiled for 1 minute, unless the cooking process involves boiling for 1 minute or more. The use of approved bottled water may be substituted for boiling the water.

Boiled water or approved bottled water should be used to wash vegetables that will be eaten raw.

F. **UTENSIL WASHING AND CLEANING**

The use of single service utensils should be recommended for use where possible.

Where three compartment sinks are utilized for washing, rinsing and sanitizing utensils and equipment, hot water sanitizing with a heating element installed in the third or sanitizing compartment that maintains water temperature of at least 170 degrees Fahrenheit is recommended and preferred. All utensils should be thoroughly air-dried before put into use.

Mechanical dishwashing that maintains a final rinse temperature of 180 degrees Fahrenheit at the manifold or 160 degrees Fahrenheit contact temperature on the utensils is recommended and preferred. All utensils should be thoroughly air-dried before put into use.

Where chemical three compartment sinks or mechanical dishwashing is utilized, sanitized utensils should be thoroughly dried. The drying procedures are outlined in Section 13.22 of the Rules and Regulations Governing Restaurants. This procedure includes air drying for five minutes and if any sanitizing solution remains, thoroughly drying with a clean paper towel.

Utensils or equipment too large to sanitize by immersion should be rinsed, sprayed, or swabbed with an approved chemical sanitizer solution, at least twice the strength normally required. All these utensils and equipment should be thoroughly dried, following the drying procedures in Section 13.22 (See above paragraph).

SAMPLE LETTER

BOIL WATER NOTICE

(Date)

(Name of establishment)

(Address)

Dear (Name of permit holder and person in charge if different)

The Department of Health has required your water supply owner to issue a BOIL WATER NOTICE to consumers, one of which is you, because of high levels of bacteria found in the drinking water source.

A contaminated water supply is a violation of the Rules and Regulations Governing and is an imminent health hazard. The continued operation of your establishment utilizing this supply without corrective action as listed in this letter, may result in the suspension of your health permit.

The (name of local health department) has been advised that your establishment's water supply must be boiled for 1 minute before it is used or consumed. Due to practical considerations you may not be able to boil for 1 minute all water that is used or consumed in your establishment. Therefore, the following corrective actions should be taken to provide safe, potable water to your employees and patrons:

USE APPROPRIATE NUMBERED PARAGRAPHS FORM POLICY AND PROCEDURE DOCUMENT i.e., restaurants---A., B., C., D., E., F. AND G.

Your health department sanitarian will be checking to see that a plan for correction has been completed at your establishment. If you have any questions concerning any of the above listed procedures, you may telephone (name of sanitarian supervisor or manager) at (telephone number).

Signed _____
(Sanitarian)

(Sanitarian Supervisor/Manager)

(Date)

NOTICE

Boil this water for 1 minute before being used for drinking or food preparation.

This water supply failed to meet the Virginia Department of Health's bacteriological standards on _____ and the condition causing this problem has not been corrected.

Date Posted _____

By _____

BOIL WATER NOTICES

**Answers to frequently
asked questions**

**Produced by
Virginia Department of Health
11/00**

**Virginia Department of Health
Protecting You and Your Environment**

Why was I advised to boil all my drinking water?

Public Health officials have advised boiling of drinking water due to a compromise in the quality of the drinking water.

Where are the bacteria coming from?

The contamination is probably coming from surface water (rainwater) that has not been naturally filtered and cleaned by going through layers of soil.

How long should I boil the water?

Boiling the water for 1 minute will kill all the organisms that cause disease.

Caution: When boiling water, use manageable sized containers and do not overfill them. Place the container on a rear burner if there are small children in the house. Let the water cool before transferring to another container.

How long will the boil water notice be in effect?

We or the Virginia Department of Health will notify you when the water is determined to be safe to drink without boiling.

Do I have to boil water to be used in beverages?

Yes, even water used for making coffee, tea, mixed drinks, Kool-Aid or any beverage made with water. In addition, all water used for making ice for consumption must be boiled.

Do I need to boil water before using it to wash vegetables that will be eaten raw?

Yes

What should I do about water used in cooking?

All water used in cooking must first be boiled for 1 minute, unless the cooking process involves boiling for 1 minute or more.

Do I have to boil my dish-washing water?

No. Adding a capful of household bleach such as Clorox to a sink full of water should be sufficient to treat the water. All rinse water should be treated with household bleach.

What about my bath water?

There is no need to boil bath or shower water even for infants. Care should be taken to make sure children do not drink the water or get the water in their mouths during bathing. No special soaps are necessary.

Is it necessary to boil water to be used for hand washing and is any special soap necessary?

No

Do I need to use boiled water to wash clothes and flush the toilet?

No

Can I haul water from my neighbor's well or spring for drinking purposes?

No. You should use water from an approved, tested source only. Without routinely testing the water for bacteriological quality there is no way to know if the water is safe to drink. Water from unapproved sources should be boiled.

Should I boil water for brushing my teeth?

Yes.

What should I do if I become sick?

See your family physician.

Your doctor may call the Virginia Department of Health Office of Water Programs at (804) 786-5566 for information about the boil water notice.

Also, your doctor should notify the local health department if he or she feels your illness was caused by bacteria in the water.

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. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Fact Sheet

Office of Water Programs
Division of Water Supply Engineering
VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

Cryptosporidium

Pub. No. FS-DWSE 95-1

Background

Cryptosporidium is a single-celled protozoan parasite that infects a variety of animals, including humans. *Cryptosporidium* is widespread in the environment, existing as an infectious, spherical oocyst, 4 to 6 microns in diameter, which is highly resistant to chlorination. When ingested, these oocysts pass through the stomach into the small intestine where they release sporozoites which invade the cells of the intestinal lining, impairing the intestine's ability to absorb water and nutrients. New oocysts are formed in the intestine which either release additional sporozoites in the host or are excreted in the feces to the environment.

Origin

All *Cryptosporidium* oocysts originate in the feces of infected animals, including humans. Oocysts from one type of animal may infect other animals. Host animals for *Cryptosporidium* include humans and other vertebrates, especially cattle. *Cryptosporidium* also infects other large mammals (wild and domestic), small mammals (rodents, cats, dogs, etc.), birds, reptiles, and fish. During active infection, the feces from the host animal may contain several thousand oocysts per milliliter.

Occurrence

Cryptosporidium oocysts occur anywhere the environment is contaminated by feces and, ultimately, find their way into virtually all of our surface water sources (including many groundwater sources under the direct influence of surface water).

Sampling and Laboratory Analysis

Sampling for the presence of *Cryptosporidium* oocysts involves filtering large quantities of water through a one (1) micron filter, removing the trapped particles, extracting the cysts and oocysts, and refiltering the extract. The sample thus obtained is then analyzed using an indirect fluorescent antibody procedure that relies heavily on the skill of an experienced microtechnician. At this time there is no accepted standard method for *Cryptosporidium* and the oocyst recovery efficiency and sensitivity are variable.

Health Effects

Cryptosporidium can cause gastrointestinal disorders (cryptosporidiosis) in humans. The disease is characterized by symptoms that include diarrhea, stomach cramps, fatigue, and loss of appetite. The public should be aware that *Cryptosporidium* infection can be asymptomatic with none of the symptoms being present. The incubation period varies from 2 to 12 days, generally averaging 7

days, and symptoms typically last for 10 to 14 days, but can linger off and on up to 30 days or longer. Small babies and the elderly may take significantly longer to recover. Cryptosporidiosis can be life threatening to immuno-compromised individuals including cancer patients, organ transplant patients, and HIV positive patients, among others.

Patient Treatment

No treatment other than rehydration, when called for, has been proven to be effective for cryptosporidiosis. The disease will normally subside on its own. Anyone with severe or protracted diarrhea should consult a physician.

Prevention

- Avoid any direct contact with human or animal feces.
- Avoid drinking water directly from lakes, streams, springs, or any unknown source.
- Wash hands after using the toilet, changing diapers, and before handling food.
- Wash hands after contact with, or cleaning up after, pets.
- Wash hands after gardening or other direct contact with the soil.
- Avoid unpasteurized milk and milk products.
- Child-care and health-care workers should be especially careful to protect themselves and avoid the possibility of spreading cryptosporidiosis from person to person.
- Persons with cryptosporidiosis should wash their hands often to avoid spreading the disease.
- Persons with diarrhea should not use public swimming facilities.
- Persons using drinking water of unknown quality or suspected to be contaminated by *Cryptosporidium* are advised to bring their drinking water to a rolling boil for at least one minute before consumption.

Standards and Health Advisories

No official EPA drinking water standard, treatment technique, or health advisory exists for *Cryptosporidium* at this time. The best protection is filtration and disinfection treatment in accordance with the Surface Water Treatment Rule.

Waterworks owners and operators are advised to optimize the performance of their filtration processes to produce filtered water turbidities no greater than 0.2 NTU, with an operational goal of 0.1 NTU.

For more information, contact: Division of Water Supply Engineering, Office of Water Programs, Virginia Department of Health, 1500 East Main Street, Room 109, Richmond, Virginia 23219. Voice (804) 371-2885 or FAX (804) 786-5567.

