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Boil Orders

What is a Boil Order?

A “Boil Order” is a notice issued to water consumers to boil all drinking and culinary water **for at least five minutes** before use. A boil order is issued by proper drinking water authorities to the consumers of a public water supply whenever analysis results indicate the water being supplied may have or has become microbiologically contaminated, the sanitary integrity of the water system may have been compromised, or following an occurrence of low water pressure. A boil order can be a necessary and required precaution to help prevent a possible water-borne illness outbreak. If certain conditions exist in the water supply that warrant a boil order, drinking water authorities should not hesitate to issue a boil order. These conditions are explained further in this chapter.

Illinois EPA Assistance

After reading this chapter, if you are still unsure or encounter a situation that was not covered, please contact your Illinois Regional Field Office.

Champaign Regional Office	217-278-5800
Elgin Regional Office	847-608-3131
Rockford Regional Office	815-987-7760
Springfield Regional Office	217-557-8761
Collinsville Regional Office	618-346-5120
Marion Regional Office	618-993-7200

For major contamination or outages that occur on weekends, holidays or after office hours, please contact the Illinois EPA Emergency Response Unit at 217-782-3637.

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Appendix A – Boil Order Example

Appendix B – Boil Order Lifted Example

Appendix C – Boil Order Door Tag Example

What is a Boil Order?

A “Boil Order” is an immediate notification to all affected customers to boil all drinking and culinary water for at least five minutes before use until further notice for at least **five** minutes before use. There are two types of boil orders:

- 1) System wide boil order (all consumers must be advised to boil water)
- 2) Localized or partial boil order (issued for users in an isolated areas within a section of the distribution system shut down by the use of valves, usually for repair or maintenance)

For localized boil orders, care must be taken after repairs are completed to keep the area under boil order isolated from the remainder of the distribution system until the sanitary quality of the water has been verified. This is accomplished by restoring water to the area under boil order by opening only one of the valves closed to isolate the area. Opening more valves may allow potentially unsafe water to flow to other areas of the distribution system which likely means a system wide boil order must be issued.

When Should a Boil Order Be Issued?

A Boil Order **MUST** be immediately issued when one or more of the following five events occur:

- 1) Water pressure drops below 20 pounds per square inch (PSI) in any portion of the distribution system. A loss of pressure in the system can allow contaminants outside the water lines to enter the water system. Pressure loss can result from **mechanical failure, power outage, main break, valve replacement, or high demand** on an undersized water main.

In the event of pressure loss, a water system may take advantage of a “boil order exception” if there is historical data that indicates that an adequate and reliable chlorine residual was maintained in the system and the affected area, along with a written record of turbidity measurements in the affected area.. A certified laboratory either on-site or otherwise readily available is required to immediately analyze the required coliform samples. A condition of the “boil order exception” also requires that turbidity readings following any repair must not vary from the historical levels. Also, you will need to follow all instructions and procedures listed at this web link:

<http://www.epa.state.il.us/water/field-ops/drinking-water/boil-order-exception-criteria.pdf>

- 2) Surface water that has entered wells or finished water storage reservoirs that are in operation at the time of flooding events. Depending on the available water treatment capabilities and the type of contamination that potentially occurred, a “do not drink” order may need to be issued. If a well that is out of service is flooded it must be tested for bacteriological quality to insure it has not become contaminated prior to use.
- 3) Any major disruption of required surface water treatment such as inadequate disinfection or the finished water turbidity exceeds 1 NTU.

- 4) Direct knowledge or suspicion that a water supply has become contaminated.
- 5) An E. coli positive sample occurs at a chlorine exempt water supply.

There are other times when a boil order may be issued. Boil orders should be issued if:

- 1) Routine distribution system water analysis results are total coliform or E. coli positive. Issuing a boil order in this case is a judgment call that is dependent on several factors:
 - number and location(s) of the contaminated samples,
 - the size of the water system,
 - results of any raw samples,
 - finished water,
 - other distribution system samples collected on the same day, and
 - location where the contamination was detected.

Issuance of a boil order may be delayed if adequate chlorine residual is present, no problems that could have affected the sanitary quality of the water were known to have occurred, and the repeat samples are promptly collected. Immediately consider increasing the chlorine residual above your normal operating levels when you are notified that any finished or distribution samples are found to be coliform positive.

- 2) In the event of sudden loss of residual or persistent low chlorine residual especially if the source has a history of coliform detection.
- 3) Indicators are present when coliform samples were taken such as; low chlorine residual, unusual turbidity, color, taste, odor, etc. and total coliform is detected during these unusual water conditions.
- 4) A single well or finished water sample and a distribution sample test positive for total coliform bacteria followed by positive distribution repeat sample(s). If multiple routine samples from one distribution area test positive, issuing a localized boil order should be strongly considered.
- 5) Water storage tank is being cleaned or inspected and cannot be isolated from the distribution system during this maintenance. If sampling is conducted according to AWWA C652, and results indicate no coliform detections and proper chlorine residual, and turbidity measurements from water in the tank that is being inspected / cleaned do not increase during the operation, a boil order is not required. Always contact your regional Illinois EPA field office for any additional requirements prior to doing such work. If the water storage tank can be isolated, no boil order is required if all requirements specified in AWWA C652 are followed. Additional information can be found at: <http://www.epa.state.il.us/water/field-ops/drinking-water/index.html>

Boil orders can be somewhat discretionary; however, it is ALWAYS best to err on the side of caution. Most operators know their system and its limitations. **If you feel something may be wrong as described above, immediately consult with the Illinois EPA Regional office. If you are unable to contact them, issue the boil order and protect yourself and the consumers.** If you are unable to contact the Illinois EPA beforehand, contact them immediately during and afterwards.

How Soon Must a Boil Order Be Issued?

Immediately after one of the conditions as specified above are met. If unsure, please immediately contact your Regional Illinois EPA office or the Division Office Headquarters in Springfield at 217-782-1020. Again, if in doubt, it is always best to err on the side of safety and issue a boil order.

Who Must Receive a Boil Order Notice?

All affected customers must be advised of a boil order. Pay special attention to major or sensitive customers: schools, nursing homes, hospitals, restaurants, food processors, and consecutive (satellite) water systems.

As soon as possible, but within 2 hours, the boil order should be reported to the County and/or local health department and to the appropriate Illinois EPA Regional office.

What Must Be Included in a Boil Order?

A boil order should be written on the water supply's letterhead and include the following information:

- Boil Order "Effective" Date and Time – All boil orders should be issued until further notice
- Affected area (system wide or isolated to certain area)
- Water Supply Contact (should be able to be reached throughout duration of boil order)
- Telephone number for additional information
- Very brief summary/explanation of problem
- What the consumer should do (boil water for at least 5 minutes)
- If possible, provide an estimate to when the boil order may be over

See Appendix A for boil order example.

How Should a Boil Order Be Distributed?

The objective to issuing a boil order is to inform ALL affected customers as quickly as possible not to drink the water without boiling it first. Water systems vary quite differently in size, distribution system network, and consumer dynamics. Each water supply should have an effective plan of distributing notification to reach the most people in the shortest amount of time. Some notification methods may include but are not limited to:

- Local radio and television stations
- Hand delivery to each customer (small towns, mobile home parks, homeowner associations, subdivisions, partial system boil orders following isolated water main repairs, etc.)
- Road signs
- Conspicuous postings in local restaurants, libraries, schools, and/or government offices, etc.
- Telephone (reverse 911)
- Email/text messaging

When direct notification is not practical, it is recommended that multiple other delivery methods be used to reach as many customers as possible. There is no requirement on how many methods must be used; however, it is the responsibility of the water system's owner, administrative contact, and operator to notify consumers in both the quickest and most effective manners to ensure public safety.

When Can a Boil Order Be Lifted and How Many Samples Do I Need to Collect?

A boil order must remain in effect until microbiological samples demonstrate that the water is safe for domestic use, or until appropriate corrective action approved by the Illinois EPA is taken. Bacteriological samples must be taken after the problem is corrected.

System Wide Boil Orders including Pre-cautionary Boil Orders	
Problem	<ul style="list-style-type: none"> -Water pressure drops below 20 PSI in any portion of the distribution system -Multiple routine distribution system analysis results are total coliform positive or confirmed E. coli positive -A well, storage tank, water main, or other treatment component undergoing repair or maintenance is placed into service before obtaining the required satisfactory sample results. -Flooding that has allowed surface water to enter wells or finished water storage reservoirs that are in operation at the time of the flooding. Depending on the available water treatment capabilities and the type of contamination that potentially occurred a “do not drink” order may need to be issued. If a well that is out of service is flooded it should be tested to insure it has not become contaminated prior to use. -Any major disruption of required surface water treatment such as inadequate disinfection or the finished water turbidity is above 1 NTU. -Direct knowledge or suspicion that a water supply has become contaminated. -E. coli positive sample at a chlorine-exempt water supply. -Sudden loss of residual or persistent low chlorine residual especially if the source has a history of coliform detection. -Indicators are present when coliform samples were taken such as; low chlorine residual, unusual turbidity, color, taste, odor, etc. and total coliform is detected during these unusual water conditions. -Source water or finished water <u>and</u> a distribution sample test positive for total coliform bacteria or if multiple samples from one area test positive
To Lift	<p>Two sets of bacteriological samples collected approximately 24 hours apart show satisfactory results when turbidity, flooding or coliform contamination is involved. Samples can be analyzed by any approved analytical method.</p> <p>One Set of bacteriological samples show satisfactory results when pressure drops below 20 psi occur (i.e. water main repairs, or a power outage or pump failure, causes low pressure, localized or system wide outage, etc.)</p> <p>Population <=4,900; <u>1 set</u> = 5 representative samples throughout the distribution system. <i>Sample Locations: If at all possible, primary and alternate sites from the coliform site plan should be used.</i></p> <p><i>Note: very small systems with fewer than 100 service connections may collect fewer than five distribution samples, based on consultation with your Regional Office. (i.e.: A very small system with 25 service connections may collect three distribution samples, rather than five distribution samples to lift a boil order)</i></p> <p>Population >4,900; <u>1 set</u> = samples equal to the routine monthly requirement <i>Sample Locations: If at all possible, primary and alternate sites from the coliform site plan may be used, but we also suggest that you use additional sites from the suspect area.</i></p> <p><i>See Appendix B for “boil order lifted” notification example.</i></p>

Localized Boil Orders	
Problem	-For boil orders affecting localized areas – typically main breaks, valve replacements, etc. –
To Lift	<p>One set of bacteriological samples collected from representative areas and all have satisfactory results.</p> <p>1 set = a minimum of one, and up to 5 representative samples. At least one sample MUST be collected in the immediate area of the break or valve replacement. Contact your Illinois EPA Regional Office.</p> <p><i>NOTE: Two sets of samples collected approximately 24 hours apart are required if any of the initial samples show coliform contamination. The entire sample set must be repeated if any sample shows coliform is present. When coliform is detected, the boil order must remain in effect until samples collected approximately 24 hours apart show no coliform.</i></p> <p><i>See Appendix B for “boil order lifted” notification example.</i></p>

Remember; do not collect coliform samples until the problem has been fixed. Give chlorine time to work. We do not need samples to confirm that a problem is still present. We need sample results to show that the problem has been fixed.

What Can I do in Advance to Be Prepared to Issue a Boil Order

Every water supply can expect to issue a boil order at one time or another. Most boil orders are issued as a precaution but do not be caught off guard. You should have a notification plan ready to implement, know how to contact affected customers, keep a list of current phone numbers for local health departments, the Illinois EPA, and major and sensitive customers. For large area boil orders a water supply should also plan for a media news release and be prepared for possible interviews from the media. It is important to also keep customers up to date on further developments. Keep a supply of bacteriological bottles and contact information for laboratories.

For smaller, localized areas it may be beneficial to include the following in your plan:

- Door hangers to distribute to affected customers
- Road signs and other postings
- Personal contact with major or sensitive customers
- A calling service

For larger areas

- Electronic media – television and radio
- Reverse 911 if available
- A calling service
- Personal contact with major or sensitive customers
- Conspicuous postings

Note: Keep a supply of door hangers available for use when localized outages caused by water main repairs occur.

What if the Problem Occurs After Hours or on a Weekend?

Owners and operators of community water supplies must immediately notify the Illinois EPA at the appropriate Regional Office when there is knowledge or suspicion that a water supply has become contaminated. For major contamination or outages that occur on weekends, holidays or after office hours the Agency may be reached through the IEPA Emergency Response Unit at 217/782-3637 or the Illinois Emergency Management Agency at 1-800-782-7860.

What is a “Do Not Drink Order”?

Boiling is the recommended action for microbiological and most volatile organic chemical contamination, but is not advised for nitrate, inorganic chemicals and non-volatile contaminants. Therefore, a “Do Not Drink Order” may be necessary as a result of a backflow incident, major spill, surface water flooding, or following many complaints of poor water quality. Use discretion regarding customer complaints. With widespread complaints of unusual taste, color, or odor it may be best to issue a Do Not Drink Order until the investigation is complete. Some contaminants may be increased by boiling.

Can Boil Order Samples Be Used to Meet Monitoring Requirements for the Routine Monthly Total Coliform Rule (TCR) Samples?

No. Boil order samples are for boil orders. They can NOT be used to satisfy any monitoring requirements specified in the TCR. No exceptions.

Should I Ever Collect My Monthly Total Coliform Rule (TCR) Samples While Under a Boil Order?

No. If a system is under a boil order, it is strongly recommended NOT to collect TCR samples since bacteriological water quality maybe compromised and sampling would not reflect normal operating conditions. TCR sampling under compromised conditions may trigger a coliform (or Fecal/E. Coli) maximum contaminant level (MCL) violation.

Will I Be in Violation if I am Unable To Collect My Monthly TCR Samples Due to an Extended Boil Order?

Yes. Failure to collect your required routine number of TCR distribution samples (and/or repeats if applicable) will result in a monitoring violation for the monitoring period. If you know in advance that monitoring requirements will not be met, it is recommended to issue the monitoring violation public notice at the same time as the boil order notice; coordinating notifications can help reduce consumer confusion and may help reduce cost.

If you decide to “chance” collecting routine TCR samples while under a boil order to avoid a monitoring violation, these sample results will always count towards compliance. If the results are coliform positive, you will not be able to invalidate results because a boil order was in effect when the routine samples were collected. Likewise, any samples labeled as “special boil order” will never count towards meeting routine coliform monitoring requirements.