
Start-up Procedures for Noncommunity Seasonal Public Water Systems

The United States Environmental Protection Agency's Revised Total Coliform Rule (RTCR) requires seasonal public water suppliers to implement a "state-approved start-up procedure." Starting April 1, 2016, seasonal systems that completely depressurize their distribution systems must start up with a state-approved procedure at the beginning of each operating season.

While all noncommunity public water suppliers that depressurize a portion of their distribution system(s) are expected to follow the practices outlined in the Minnesota Department of Health (MDH) approved start-up procedure, **only those that completely depressurize their distribution system(s) are required to certify (document) its implementation.** MDH must receive certification from the public water supplier that the state-approved start-up procedure has been completed.

Start-up at a seasonal public water supply is the opportune time for a thorough examination of the water system's physical components. If repairs are needed, they can be accomplished prior to the start of the season without being an imposition on customers. Properly maintained systems are less likely to have water quality problems that can lead to dissatisfied customers and/or increased regulatory oversight.

The sanitary condition of distribution system piping and components observed at the time of start-up is a reflection of the condition in which the system was depressurized at the time of shutdown. While a "shut down plan" is not part of the seasonal start-up procedure, it is strongly encouraged to leave piping and components in as sanitary condition as possible when the system shuts down for the season. It is also important to keep in mind that properly licensed professionals are required when plumbing and well repair work is done.

The MDH approved procedure consists of the following required elements: a system inspection, an integrity check, and a thorough system flushing. Following this procedure will help ensure compliance with the RTCR and will assist the public water supplier to properly maintain the system.

*A **seasonal system** is a noncommunity public water supply that:*

- *does not operate on a year-round basis and,*
- *starts up and shuts down at the beginning and end of each season.*

*A **state-approved start-up procedure:***

- *provides public health protection by offsetting an increased contamination risk in water systems where piping and other system components are depressurized.*
- *promotes proper maintenance and system self-inspection.*

Public water suppliers that completely depressurize the distribution systems must:

- ***implement a state-approved start-up procedure, and,***
- ***certify to MDH compliance with the procedure before serving water to the public.***

Required Elements

System Inspection

- Look for any damage or evidence of contamination that may have occurred during the off-season.
- Inspect the wellhead(s) and verify that the well casing is structurally sound, the well cap is tightly attached, vents are downturned with intact screens, and electrical conduit is securely in place.
- Assess water treatment equipment and storage tanks.
- Perform a walk-through of the distribution and plumbing systems.
- Observe pipes, valves, and backflow prevention devices. Ensure that valves are exercised (turned off and on) and repair/replace as needed.

Integrity Check

Leaks in the system, especially in buried piping, provide potential conduits for contaminants to enter when the system is drained or when system pressure is lost. To help gain a better understanding of leakage within the distribution system(s), conduct an integrity check once the system is re-pressurized.

1. After the distribution system is filled and pressurized, turn off all taps and the power supply to the well pump.
2. Read the system's pressure gauge and write down the initial system pressure.
3. After one hour, read the pressure gauge again and document the system pressure. Pressure loss over this one hour time span indicates leaks.

Some system leakage is expected, however locating and repairing leaks is strongly recommended. Ensure that repaired/replaced distribution system components are properly disinfected. Having the ability to isolate and then retest portions of the system (rather than the entire distribution system) can assist in locating leaks. Comparing pressure loss data from year to year can provide insight into the relative degree of leakage within the distribution systems.

In the year 2016 only, if a functional pressure gauge is lacking, a distribution integrity check can be accomplished by documenting the number of well pump on/off cycles that occur over a one hour period when no water is being used - a cycling well pump indicates leaks. Systems with pressure tank working volumes that exceed the volume of leaking water will not experience pump cycling. **All seasonal systems are required to utilize functional pressure gauges in their start-up procedure by 2017.**

Flushing

Flushing is essential maintenance; it removes contaminants and debris from the system.

- Flush all wells and watermains for a minimum of 30 minutes.
- Waste this water to the ground surface rather than into a sewage treatment system. Be aware that adequate flow is necessary to effectively flush lines, therefore open sufficient taps to obtain maximum flow rate.
- Prior to flushing, remove all faucet strainers to prevent sediment from clogging them.
- If possible, flushing should progress from taps closest to the well and end at taps furthest from the well to ensure that clean water is used during flushing.
- Flush all service lines and building plumbing for a minimum of five minutes and the water runs clear. Large distribution systems may need to be flushed in sections one at a time in order to achieve adequate flow rates for effective flushing.

Recommended Elements

System Disinfection

Water system disinfection is strongly encouraged by MDH and is an optional step in the start-up procedure. Disinfection kills microorganisms that can be introduced during shut down or the off-season when the system is depressurized. Water system disinfection can be accomplished by introducing a solution of chlorine and water directly into the well, running it throughout the system, and allowing adequate contact time before flushing. For the MDH recommended well disinfection procedure, refer to:

<http://www.health.state.mn.us/divs/eh/water/factsheet/ncom/welldisinfection.pdf>.

Disinfection is not always feasible (e.g. flowing wells, wells containing drawdown seals, wells with packer-jets) or desirable due to corrosion potential or sedimentation within the well. In these cases, the distribution can be disinfected without introducing a disinfecting solution into the well itself. Consult with a professional to determine how disinfecting the distribution system (and not the well) can be best accomplished.

Water Testing

Your sanitarian will collect a water sample for total coliform bacteria during the operating season at the time of greatest vulnerability. However, it is recommended that all public water supplies collect and test their drinking water prior to opening for the season. This will help identify any water quality problems before opening and serving the public. If the water system has been disinfected, assure that all the chlorine is flushed from the system prior to collecting the sample to be analyzed. A chlorine test kit or test strips should be used to assure there is no chlorine residual in the water system. A list of laboratories certified to perform total coliform bacteria analyses on drinking water is located at:

<https://apps.health.state.mn.us/eldo/public/accreditedlabs/labsearch.seam>

Summary

- The Revised Total Coliform Rule takes effect on April 1, 2016.
- At that time, noncommunity seasonal public water systems that completely depressurize their distribution systems are required to follow the state-approved procedure and certify its implementation.
- Refer to the ***Seasonal System Start-up Procedure Checklist*** at <http://www.health.state.mn.us/divs/eh/water/factsheet/ncom/index.html> for specific information.
- Contact your sanitarian if you have questions about seasonal opening procedures. Sanitarian contact information is available at: <http://www.health.state.mn.us/divs/eh/water/org/index.cfm>



For more information, contact:
Drinking Water Protection Section
Noncommunity Public Water Supply Unit
Email: health.noncommunitycompliance@state.mn.us



Date _____

Seasonal System Start-up Procedure Checklist

Required Steps (1 through 3)

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| √/NA | 1. System Inspection |
| | <i>Well</i> |
| | Well casing is structurally intact. |
| | Well cap or sanitary seal is in good repair and forms a tight seal. |
| | Electrical wiring is in conduit with watertight connection where it enters the well cap. |
| | Vent is screened, clean, and in good repair. |
| | Well is physically protected if in high traffic area (e.g. protective posts). |
| | No flooding within 50 feet of the well. Contact your district sanitarian if flooding has occurred. For a list of district sanitarians, see http://www.health.state.mn.us/divs/eh/water/org/index.cfm . |
| | Ground surface is sloped to divert surface water away from the well. |
| | No visible problems with potential contaminant sources within 200' of the well. |
| | No potential contaminant sources are being stored inside the pump house. |
| | A sample tap for each well is accessible and operational. |
| | <i>Pressure Tank</i> |
| | Tank is in good condition with no indication of prior leakage, (e.g. staining). |
| | Preset pressure on bladder/diaphragm tank is set approximately 2 psi below the system's low pressure limit (or pump on pressure). |
| | System pressure gauge(s) is/are in place and operational. |
| | <i>Non-pressurized Storage Tank</i> |
| | Storage tank is covered and in good condition (e.g., no crack, holes, dents, in tank). |
| | Interior of tank is clean and free of sediment. It is recommended that the tank be disinfected as part of the start-up procedure. A fact sheet for disinfecting non-pressurized storage tanks will be available shortly. |
| | Vent and overflow screens are clean and intact. |
| | Tank hatch is properly fitted and secure with no evidence of insects or rodents. |
| | <i>Treatment (e.g. water softener, reverse osmosis, filters, etc.)</i> |
| | Treatment components are clean and in good condition with no indication of leakage. |
| | No safety issues identified, (e.g., loose or exposed wiring). |
| | Treatment unit backwash/regeneration discharge lines have proper air gap. |
| | All chemical containers are clean, labeled, and properly stored. |
| | All chemicals are National Sanitation Foundation (NSF) certified and within expiration dates. |
| | Treatment unit is operated and maintained according to manufacturer's instructions. |

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| | <i>Distribution System</i> | | | | | | | | | | | | | | | | | | | | | | | | |
| | Dead end piping and inoperable treatment units have been identified, and/or removed. | | | | | | | | | | | | | | | | | | | | | | | | |
| | Backflow protection devices are in place and operational. | | | | | | | | | | | | | | | | | | | | | | | | |
| | Distribution system valves have been exercised (opened and closed) and are not leaking. | | | | | | | | | | | | | | | | | | | | | | | | |
| √/NA | 2. Integrity Check (conducted after system is filled with water) | | | | | | | | | | | | | | | | | | | | | | | | |
| | Pressure tanks are functioning properly (not waterlogged). | | | | | | | | | | | | | | | | | | | | | | | | |
| | Document the operating pressure range for each distribution system. | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <tr> <td>System A</td> <td></td> <td>Low psi (pump on)</td> <td></td> <td>High psi (pump off)</td> <td></td> </tr> <tr> <td>System B</td> <td></td> <td>Low psi (pump on)</td> <td></td> <td>High psi (pump off)</td> <td></td> </tr> <tr> <td>System C</td> <td></td> <td>Low psi (pump on)</td> <td></td> <td>High psi (pump off)</td> <td></td> </tr> </table> | System A | | Low psi (pump on) | | High psi (pump off) | | System B | | Low psi (pump on) | | High psi (pump off) | | System C | | Low psi (pump on) | | High psi (pump off) | | | | | | | |
| System A | | Low psi (pump on) | | High psi (pump off) | | | | | | | | | | | | | | | | | | | | | |
| System B | | Low psi (pump on) | | High psi (pump off) | | | | | | | | | | | | | | | | | | | | | |
| System C | | Low psi (pump on) | | High psi (pump off) | | | | | | | | | | | | | | | | | | | | | |
| | Each distribution system has been examined for leakage by closing all taps, switching the well pump(s) off, and documenting system pressure loss over a one-hour period. | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <tr> <td>System A</td> <td></td> <td>Start psi</td> <td></td> <td>End psi (after 1 hr)</td> <td></td> <td>Pressure Loss</td> <td></td> </tr> <tr> <td>System B</td> <td></td> <td>Start psi</td> <td></td> <td>End psi (after 1 hr)</td> <td></td> <td>Pressure Loss</td> <td></td> </tr> <tr> <td>System C</td> <td></td> <td>Start psi</td> <td></td> <td>End psi (after 1 hr)</td> <td></td> <td>Pressure Loss</td> <td></td> </tr> </table> <p>In the year 2016 only, distribution systems can be assessed for leakage by documenting the number of pump on/off cycles over a one-hour period with all taps closed. Beginning in 2017, an operational pressure gauge must be provided for each distribution system.</p> | System A | | Start psi | | End psi (after 1 hr) | | Pressure Loss | | System B | | Start psi | | End psi (after 1 hr) | | Pressure Loss | | System C | | Start psi | | End psi (after 1 hr) | | Pressure Loss | |
| System A | | Start psi | | End psi (after 1 hr) | | Pressure Loss | | | | | | | | | | | | | | | | | | | |
| System B | | Start psi | | End psi (after 1 hr) | | Pressure Loss | | | | | | | | | | | | | | | | | | | |
| System C | | Start psi | | End psi (after 1 hr) | | Pressure Loss | | | | | | | | | | | | | | | | | | | |
| √/NA | 3. Flushing | | | | | | | | | | | | | | | | | | | | | | | | |
| | Watermains have been flushed with adequate flow for a minimum of 30 minutes to the ground surface. Note: Do not flush into the subsurface treatment system (SSTS). | | | | | | | | | | | | | | | | | | | | | | | | |
| | Building service lines and plumbing have been flushed with adequate flow for at least five minutes until the water runs clear. | | | | | | | | | | | | | | | | | | | | | | | | |

Recommended Steps (4 and 5)

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| √/NA | 4. System Disinfection |
| | Distribution system has been disinfected and thoroughly flushed to remove chlorine. Note: Do not flush into the SSTS. See http://www.health.state.mn.us/divs/eh/water/factsheet/ncom/welldisinfection.pdf |
| √/NA | 5. Water Testing |
| | Absence of chlorine residual verified using an appropriate testing method, (e.g., chlorine test strips) if the distribution system was disinfected. |
| | Each distribution system is sampled and tested for coliform bacteria at a certified laboratory. See https://apps.health.state.mn.us/eldo/public/accreditedlabs/labsearch.seam for a list of certified labs. Water testing must demonstrate that total coliform bacteria are absent prior to serving water to the public. Contact your district sanitarian for assistance as needed. Note: Routine samples are still required to be collected at the time of greatest vulnerability during the operating season by your district sanitarian or delegated program staff. |
| | Sample bottle kits have been received by the system if on monthly or quarterly monitoring. Expired sample bottles have been discarded. |