Public Water Supply Flood Recovery

Floods are the most common and widespread of all natural disasters, except fire, according to the Federal Emergency Management Agency. Most communities have experienced some degree of flooding following heavy rain or spring and winter thaws.

Floods pose a particular threat to drinking water systems because floodwaters often contain biological and chemical contaminants that can make consumers sick.

What do we do if our water system has been affected by flood waters?

Safety – Before beginning recovery efforts, make sure that you have safe access to the affected areas. All electrical devices, wiring, and wiring connections exposed to floodwater or high groundwater may be damaged and pose the risk of electrical shock and equipment damage.

Assessment - Assess sanitary aspects of critical facilities. Look for signs of flood water intrusion or damage. You may see discolored or turbid water, damaged hatches or other structural failures. Evaluate:

1. Water sources – Wells should be evaluated for structural damage and signs of surface water or high groundwater intrusion. Surface water sources may experience water quality changes that require additional or modified treatment.
2. Treatment units, clearwells and storage tanks – All treatment units, clearwells and storage tanks should be evaluated for structural damage and signs of surface water or high groundwater intrusion. Determine whether you have the ability to bypass portions of your treatment train and whether doing so would render the water unsafe to drink.
3. Power supply, motors, electrical gears and connections – All affected electrical systems should be thoroughly dried and evaluated for damage by an approved contractor.
4. Distribution system – The distribution system should be evaluated for signs of failure and low pressure. The systems ability to maintain pressure should also be evaluated.

Isolation – If at all possible, isolate contaminated facilities from the rest of the system. Recovery efforts will be faster and more effective if contamination is limited to a contained portion of the system.

Customers may be persistent in their request to have untreated or even contaminated water provided to the distribution system for firefighting and flood cleaning activities. However, if the distribution system has not been compromised, it is critical that you protect it by maintaining pressure to prevent contamination from backflow. This may require water rationing and/or the provision of alternate water sources.

Repairs – If structural failures or sanitary defects are found, these should be corrected prior to disinfection. Failure to do so may result in ongoing water quality problems and require repeated disinfection efforts.

Disinfection – Contaminated water should be purged or flushed from the unit or system prior to disinfection. The unit or system should then be cleaned and shock chlorinated, allowing the chlorine to remain in the system, providing adequate contact time for thorough disinfection. The solution should then be flushed to waste.

Disinfection and Shock Chlorination procedure resources:

1. AWWA Standard C654: *Disinfection of Wells*
2. AWWA Standard C651: *Disinfecting Water Mains*
3. *Shock Chlorinating Small Water Systems* at http://www3.abe.iastate.edu/HTMDOCS/pm899.pdf

Testing – After affected parts of the system have been adequately flushed and disinfected, the system must be sampled for Total Coliform and *E. coli* as indicators of microbial quality.

1. Number and location of samples – The number and location of samples will be system dependent. The sampling effort must be representative of the entire distribution system as well as any source, treatment and storage units potentially contaminated by flood water. Samples collected for this purpose should be labeled "Special" and will not count toward compliance.
2. Frequency – Two sets of samples shall be collected with the second collected at least 8 hours after the first.

If sample results from both sample sets indicate that the water is bacterially safe and all sanitary hazards have been addressed, the water is presumed safe for human consumption. At this point, it is advisable to maintain an elevated free chlorine residual (1 ppm) throughout your system until there is assurance that all sanitary hazards have been addressed.

However, if coliform bacteria or *E. coli* are present, the system should again be inspected for sanitary defects, appropriate repairs made and shock chlorination repeated. Wells that are not adequately disinfected by shock chlorination should be mechanically cleaned by a certified well professional.

Note: Well disinfection will not provide protection from nitrates, pesticides, heavy metals, fuels, oils, and other types of non-biological contamination. If such contamination is suspected, due to proximity of these types of contaminant sources, special testing and treatment of the well water is required. Please contact IDNR for more information.

Public Notification

If flood water has affected drinking water quality, you must notify the Iowa Department of Natural Resources and consumers of the potential threat to human health as soon as possible but in no case later than 24 hours after the event. The IDNR consultation will include a discussion of recovery efforts as well as required public notification language

and dissemination methods. Depending on conditions at each facility, a Boil Water or Do Not Use Advisory may be required.

Remember that your customers' perception of risk during a flood may be high. They need timely and accurate information about the quality of their drinking water. Not all customers experience the same flooding conditions. Some may feel a direct threat from floodwaters while others do not. It's important to know your water quality and communicate to all customers. Make sure your customers have the information they need to make good decisions about their drinking water.

Regulatory Concerns

1. Inability to monitor due to inaccessibility, safety concerns or operational failures – If samples cannot be collected for any of these reasons, contact DNR to discuss options to revise the monitoring schedule.

DNR Contact Information

Field Office 1, Manchester: 563-927-2640
Field Office 2, Mason City: 641-424-4073
Field Office 3, Spencer/Storm Lake: 712-262-4177 / 712-732-8350
Field Office 4, Atlantic: 712-243-1934
Field Office 5, Des Moines: 515-725-0268
Field Office 6, Washington: 319-653-2135
After Hours Emergency Response Hotline 515-281-8694

Richard A. Leopold, Director
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On File

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