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# Introduction

## **Purpose**

To protect the health of the American public, it is crucial that we ensure that drinking water is safe for use by everyone, especially within the agricultural and food sector. Everyone involved in the treatment, storage and distribution of water is responsible for ensuring the safety of our water supply. In addition, everyone involved in the food chain, from farmer through consumer, has a responsibility in food safety.

The U.S. Environmental Protection Agency (U.S. EPA) serves as the Sector Specific Agency for the Water Sector assisting drinking water and wastewater utilities in preparing to respond to and recover from all-hazards that may negatively impact the utilities ability to treat and transport safe water. Water utilities face several threats that may result in contamination of water supplies arising from intentional contamination, or spills, leaks, floods, and broken mains. Despite these threats, water utilities, their state primacy agencies, Water/Wastewater Agency Response Networks (WARN), water associations, EPA, the U.S. Centers for Disease Control and Prevention (CDC) and the US Army Corps of Engineers (USACE) continue to work together to protect human health and the environment with clean and safe water.

At any point during production or distribution, food can be contaminated either accidentally, from employee error, or on purpose, from sabotage, fraud, or terrorist activities. Regardless of the circumstances, the U.S. [Food and Drug Administration](http://www.fda.gov) (FDA) and U.S. Department of Agriculture [Food Safety and Inspection Service](http://www.fsis.usda.gov/) (USDA FSIS), collaborating with State and local agencies, work closely to safeguard the American food supply.

Through this working relationship, the FDA and USDA FSIS continuously seek new ideas and strategies to reduce the incidence of human health emergencies and to support food defense-related innovation. In light of food defense concerns, it is incumbent that local, state, and federal governments and industry partners understand the roles and responsibilities of all participating entities.

This situation manual (SITMAN) begins with an overview of the food and agriculture and water sectors. The scenario is situated in an industrial park and addresses the interdependencies between the sectors and the need to coordinate regulatory and response resources during a contamination event.

## **Overview**

**Food and Agriculture Sector**

The Food and Agriculture Sector has the capacity to feed people well beyond the boundaries of the nation. The sector is almost entirely under private ownership and is composed of an estimated 2.2 million farms, approximately 880,500 firms, and over one million facilities. This sector accounts for roughly one-fifth of the nation's economic activity and is overseen at the federal level by the U.S. Department of Agriculture and the Department of Health and Human Services' Food and Drug Administration.

The Food and Agriculture Sector has critical dependencies with many sectors, but especially with:

• Water, for clean irrigation and processed water;

• Transportation Systems, for movement of products;

• Energy, to power the equipment needed for agriculture production and food processing; and

• Banking and Finance, Chemical, Dams, and other sectors as well.

**Water Sector**

Presidential Policy Directive-21 (PPD-21) designates the U.S. Environmental Protection Agency (U.S. EPA) as the federal lead for the Water Sector's critical infrastructure protection activities. Many resilience activities are carried in coordination between the Agency and EPA's Water Sector partners.

The Water Sector is vulnerable to a variety of attacks through contamination with deadly agents, and physical attacks (e.g.- the release of toxic gaseous chemicals) and cyber-attacks. If these attacks were to occur, the result could be large numbers of illnesses or casualties and/or a denial of service that would also impact public health and economic vitality. Critical services such as firefighting or healthcare and other dependent and interdependent sectors, such as Energy, Transportation Systems, and Agriculture and Food, would be negatively impacted by a denial of service from the Water Sector.

## **Participants**

Through the collaboration and coordination with multiple stakeholders, many will benefit from participating in this scenario. We encourage as many of the following groups as possible to participate in this exercise so that they can contribute to the overall understanding of the scenario, develop and/or strengthen working relationships with other organizations and benefit from the collective dialogue.

Participants in this scenario could include: EPA Office of Water, EPA regional offices, FDA Center for Food Safety and Applied Nutrition (CFSAN) Food Defense and Emergency Coordination Staff (FDECS), FDA Office of Crisis Management, Office of Emergency Operations, FDA Center for Veterinary Medicine (CVM) Division of Compliance Import/Complaint/Emergency/Recall Team, FDA regional offices, USDA FSIS, CDC, state drinking water primacy agencies, water utilities, local, State, Tribal and territorial public health epidemiologists, and regulatory environmental health professionals, laboratories, and food industry.

## **Exercise Objectives**

At the conclusion of this tabletop exercise, participants will be able to:

* identify interdependencies between the food and agriculture and water sectors;
* assess agency capabilities in a preliminary fashion;
* determine players and resources; and
* assess lines of communication.

## **Exercise Structure**

This exercise is designed to be an interactive, facilitated tabletop exercise. Participants are encouraged to learn from each other and ask questions of one another. The scenario is based on a real situation and has been designed by a group of subject matter and instructional design experts to provide participants with a real life, plausible food and water safety scenario. While this scenario has been simplified in order to present the information in an effective way, the scenario itself and the discussion questions have been designed to encourage participant dialogue and to surface topics that are critically important to reacting to such incidents.

The exercise contains two tracks: food and water. The Lead Planner may select which track to use based on the participants. For example, if the participants are mostly from FDA and USDA, it may be best to use the food track, as this track emphasizes the food aspect of this exercise. Conversely, if the participants are mostly EPA, state drinking water primacy agency and water utility personnel, the water track may be used. Regardless of the track selected, the overall objectives of the exercise remain the same. Be sure to delete the track you are not using in both Modules 1 and 2 of the SITMAN. Questions are the same regardless of the track chosen. The exercise has also been developed to provide participants with an opportunity to explore important topics such as interagency collaboration, jurisdictional issues and risk communication.

This exercise was initially developed jointly by EPA and FDA and was revised by the Institute of Food Technologists and Horsley Witten Group, Inc. on behalf of FDA CFSAN Food Defense and Emergency Coordination Staff and the EPA Office of Water’s Water Security Division.

This exercise is a multimedia, facilitated tabletop exercise (TTX). Participants will respond to two modules:

* **Module 1** **–** Identification of Incident
* **Module 2 –** Identification of Response Actions

## **Exercise Guidelines**

As with any learning experience, it is important that this exercise is conducted in a safe learning environment so that all participants can share and explore concepts with one another while discussing multiple solutions and options for a given issue. This exercise will operate under the following guidelines:

* This will be an open, low-stress and non-public learning environment and is not intended to set precedents.
* Participants are expected to listen to and respect the varying viewpoints of all of the other participants.
* The scenario we will discuss is plausible and the events could occur as presented. Suspend your disbelief and feel free to discuss differing policies and procedures during the breakout discussion.
* Today’s facilitator is not necessarily a subject matter expert, and participants are expected to provide the expertise needed to ensure that our discussion is accurate and thorough.
* We will apply findings from today’s activities to our job/functions and share key findings with colleagues.

## **Roles and Responsibilities**

**Lead Planner –** The person who has overall responsibility for the tabletop exercise, including convening the Planning Team and all pre- and post-exercise needs.

**Participants –** Respond to the scenario based on their first-hand, experiential knowledge; current plans and procedures of their individual entity, agency or jurisdiction; and insights from training and experience.

**Evaluator(s) –** Record the highlights of the discussion at each breakout table. Evaluators do not participate in the exercise but capture the essence of the dialog for use in the After Action Report. Evaluators are chosen on the basis of their expertise in the areas they are to observe.

**Facilitator –** Generally leads the exercise, provides situation updates and moderates discussions. Facilitators also provide additional information and resolve questions as needed. Key officials may also assist with the facilitation as subject matter experts during the exercise.

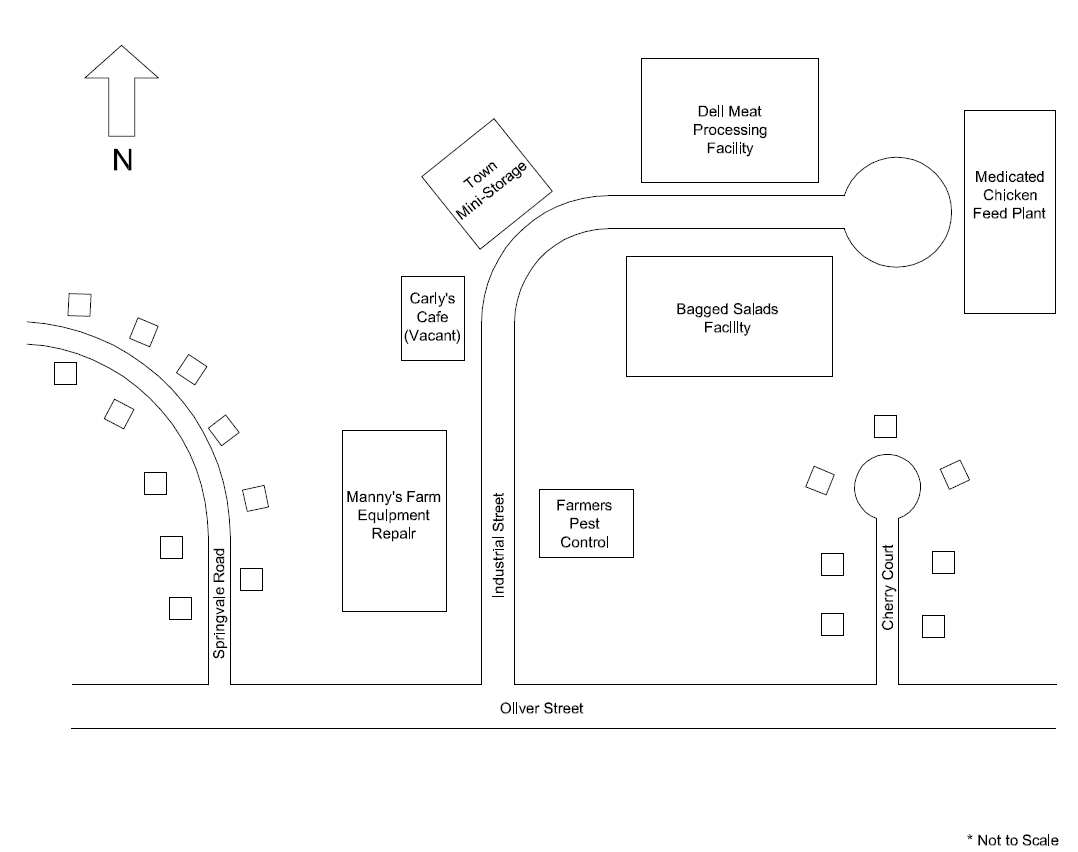
**Group Leader –** Representative from each table, volunteered by the group, who will lead the group as it explores discussion questions and the breakout activities.

**Group Recorder/Reporter –** Representative from each table, volunteered by the group, who will ensure that the group discussions are kept on time; record the key themes discussed at the table; and will be responsible for reporting out during the large group dialogue.

# Module 1 – Identification of the Incident

**Day 1 / Friday**

It is early spring at a local industrial park that houses a number of tenants, including a medicated chicken feed plant, agricultural weed services provider, sandwich shop, self-storage facility, deli-meat processing facility, farm-equipment repair shop, and a custom cabinetry maker (see map below). Taking advantage of the end of the week timeframe and anticipated low water demand, the local water department prepares to turn off the water for planned after-hours maintenance on the industrial park’s water main. The location of this work is about a quarter mile down Industrial Street; past the sandwich shop but before the deli meat processing facility. Shortly after 5:00 PM, water department workers shut the water supply off to begin the scheduled repairs. When repairs are complete on the water main, the water department re-pressurizes the line and departs.



## **Track 1 - Food**

**Day 4 / Monday**

An employee at the deli meat processing company over the weekend notices a weird odor on the processing line he is working on. After reporting that to the manager at the processing facility, the manager decides to call the local/county health department point of contact to give them a heads up and to seek guidance on what he should be doing to investigate this incident.

Following the weekend, on Monday, the sandwich shop opens up early to brew coffee and bake muffins for arriving workers at the industrial park. As a worker runs water to begin filling coffee makers, she notices a strong chemical odor. She calls her supervisor, who later decides to call the local water department to find out what is going on. The water was fine on Friday, and no one has been in the shop during the weekend. Being certified by a national sanitation training program, the food service manager at the deli shop also calls to notify the local/county health department of the issue.

Later that Monday, the water department reviews its files, and realizes that after-hours scheduled maintenance was performed in the industrial park on Friday evening. The water department also reviews its customer complaint calls received during the weekend and into Monday morning, but has no record of relevant complaints. The water department sends a field crew to the sandwich shop to investigate and to potentially collect water samples. At the same time, the local health department has also not received any complaints that tie directly to the coffee shop during the weekend.

The field crew arrives at the sandwich shop by noon on Monday and verifies the strong chemical odor and begins to collect water samples for laboratory analysis. The water utility calls the state drinking water primacy agency to alert them of the situation and to seek advice. In consultation with the primacy agency, the water utility issues a “Do Not Drink” notification to the residents of the industrial park. However, by this time, most businesses in the industrial park are already operational and employees may have used potentially tainted water.

**Note: About water use advisories.**

**If there is a water quality problem, and it involves a Safe Drinking Water Act-regulated contaminant, the water utility follows the Public Notification Rule to inform the public of the problem and provide instructions on what to do. Water use advisories can range from boiling water to not drinking or using the water. Because water use advisories cause great inconvenience for customers and can affect the local economy (restaurants and other businesses may have to close), water utilities take their public notification responsibilities very seriously and want to ensure that they are issuing the correct notification in a timely fashion.**

## **Track 2 - Water**

**Day 4 / Monday**

The sandwich shop opens up early to brew coffee and bake muffins for arriving workers at the industrial park. As a worker runs water to begin filling coffee makers, she notices a strong chemical odor. She calls her supervisor, who decides to call the local water department to find out what is going on. The water was fine on Friday, and no one has been in the shop during the weekend.

The water department reviews its files, and realizes that after-hours scheduled maintenance was performed in the industrial park on Friday evening. The water department also reviews its customer complaint calls received during the weekend and into Monday morning, but has no record of relevant complaints. The water department sends a field crew to the sandwich shop to investigate and to potentially collect water samples. At the same time, the local health department has also not received any complaints that tie directly to the coffee shop during the weekend.

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## **Task**

Use your allotted time to consider the developments and questions assigned to your group for Module 1.

* Identify any additional requirements, critical issues, decisions, and questions you think should be addressed at this time.
* Unanswered questions should be recorded for discussion with the entire group.

## **Questions for Participant Groups**

**Food/Feed Industry**

1. How was your establishment notified about an interruption of service? Whose responsibility would it be to make the arrangements?
2. Are food/feed companies, retail establishments, and other food firms required to have alternate water plans? Or does production and processing just stop? Are there standard operating procedures (SOP) in place?
3. Would a food company be notified of a problem with the water system? Whose responsibility would it be to make that arrangement?
4. How dependent are food/feed companies, retail establishments, and other food firms on an uninterrupted water supply?
5. Whose responsibility is it to notify you of the water contamination? Whose responsibility is it to notify FDA, USDA FSIS or state and local regulatory agencies about the potential risk to food?
6. Are there other businesses, either upstream or downstream from the affected bakery that could potentially be involved?

**Local Water Utilities, State Drinking Water Primacy Agency and State/Local Health and Agriculture Departments**

1. How long would it take to identify the contaminant? What analyses would you have performed? Who would help you to decide?
2. What are your Standard Operating Procedures (SOP) for an incident such as contaminated water?
3. Did the water company use any chemicals during the repair?
4. What operational responses would you consider? Would isolation of the system be an option, and what are the ramifications from this action?
5. Is this an intentional or unintentional contamination incident? How would you determine this? How does this change your notifications and actions? Your precautions?
6. Whose responsibility is it to provide alternate drinking water during the “Do Not Drink” water use advisory in your community?
7. When would the state primacy agency notify EPA? What support is expected from EPA?

**Federal Agencies (FDA, USDA FSIS, EPA)**

1. Would EPA notify FDA of the contamination situation? Or vice versa?
2. How would communications flow between EPA and FDA? Are there shared list serves, alert services, or a web portal that the agencies can take advantage of?
3. What written protocols exist for inter- and intra-agency interaction?
4. What capabilities can each agency provide and what resources are needed to manage the incident effectively?
5. What discussions have taken place between FDA and their regulated community regarding interruptions in water quantity or quality?
6. Are there other industries that food/feed companies rely on that are also dependent on water?
7. If there is perceived value in establishing working relationships between food/feed production companies and water suppliers, and what can the agencies do to encourage this interaction?

# Module 2 – Identification of Response Actions

## **Track 1 - Food**

**Day 4 / Monday**

As a part of their ongoing investigations and while awaiting laboratory results from the collected samples, the water utility starts door-to-door interviews with the other tenants of the industrial park. They are looking for any other signs of water quality problems or any other unusual activity that might help to explain the chemical odor in the water at the sandwich shop. The agricultural weed services provider notes that they do not believe that they are experiencing any water quality problems, but relates a strange incident that occurred on Friday night when they were trying to fill one of their spray trucks. At that time, one of their workers was mixing a glyphosate-based herbicide with water in preparation for spraying at a customer’s site the next day. The herbicide was already in the 500-gallon container on the back of the truck, and the worker dangled a hose into the container to fill it the rest of the way with water. Knowing that it took the tank some time to fill, the worker left the filling tank and went into the office to finish paperwork for the day.

When the worker returned to his truck to check on the status of the tank, the container on the back of the truck was empty and the hose no longer had running water. But, with it being Friday, the worker decided to leave for the evening and begin the mixing process again first thing on Monday morning. The water was flowing this morning so the business thought nothing about it.

The water department now realizes that when they shut down the water main and depressurized it last Friday, the dangling hose acted as a siphon and sucked the herbicide from the truck into the industrial park’s water main. As is the case with many older buildings, there is no backflow control device on the agricultural weed services provider’s water line.

Meanwhile, the local public health department notifies the state of the issue while still trying to get a grasp on the scale and scope of the event. Law enforcement has been involved in investigating whether this was a malicious act by an individual or a group of individuals attempting to sabotage the water supply. Therefore three separate lines of inquiries are being conducted at the same time – by the water department, the health department(s), and by law enforcement agencies.

**Day 5 / Tuesday**

Based on what they learned on Monday, the water utility and the primacy agency were able to significantly narrow the analytical scope being performed by the laboratory. Lab results soon reveal concentrations of the herbicide at 5.7 parts per billion (ppb) in the water supply in the impacted area. No one gets tainted coffee from the sandwich shop, but the medicated chicken feed and the deli meat processing plants are 24-7 operations that were in full production during the weekend, and the bagged salad processor ran a limited production line on Saturday.

The deli meat processor noted that shipments from three separate lots of the meat processed on Saturday were shipped out on Monday morning. Shipments were made to five facilities located in three different states and two other local businesses. Once the results implicated the water, customers were notified of the possible hazard and recall of the implicated lots.

Due to the expanded scope of distribution of the deli meat processor, federal and state food and agriculture agencies get involved with the investigation of the incident and begin work with their state and local counterparts to respond to and mitigate the potential impact of this crisis event.

With expanding lines of inquiries – water, health, food/ag, and law enforcement -- concern is growing about whether information will flow between appropriate groups in an effective and efficient manner.

## **Track 2 - Water**

**Day 4 / Monday**

As a part of their ongoing investigations and while awaiting laboratory results from the collected samples, the water utility starts door-to-door interviews with the other tenants of the industrial park. They are looking for any other signs of water quality problems or any other unusual activity that might help to explain the chemical odor in the water at the sandwich shop. The agricultural weed services provider notes that they do not believe that they are experiencing any water quality problems, but relates a strange incident that occurred on Friday night when they were trying to fill one of their spray trucks. At that time, one of their workers was mixing a glyphosate-based herbicide with water in preparation for spraying at a customer’s site the next day. The herbicide was already in the 500-gallon container on the back of the truck, and the worker dangled a hose into the container to fill it the rest of the way with water. Knowing that it took the tank some time to fill, the worker left the filling tank and went into the office to finish paperwork for the day.

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Due to the expanded scope of distribution of the deli meat processor, federal agencies get involved with the investigation of the outbreak and work with their state and local counterparts to respond and mitigate the impact of this crisis event.

## **Task**

Use your allotted time to consider the developments and questions assigned to your group for Module 2.

* Identify any additional requirements, critical issues, decisions, and questions you think should be addressed at this time.
* Unanswered questions should be recorded for discussion with the entire group.

## **Questions for Participant Groups**

**Food/Feed Industry**

1. If your product is implicated in a food/feed contamination event, how quickly can you identify the upstream sources of the raw materials or ingredients that you use? Not just one step back, but more comprehensively back to the agricultural origins?
2. Have commercial food/feed companies met with their water service suppliers (and vice versa), toured their facilities, and coordinated plans and communications for an emergency? Have they created Standard Operating Procedures (SOPs)?
3. How would plumbing within the medicated chicken feed plant, deli processor and bagged salad facility be rehabilitated and who would declare that the water within the facilities is safe for production again? Is the plumbing within the facilities up to code?
4. What actions are necessary in regards to the feed, deli meat and bagged salad processed over the weekend? Do you have a crisis management plan for handling a recall situation based on a production water contamination incident? Who would lead and coordinate this?
5. What are the SOPs for detecting tainted product in your process? What kind of QA verification is performed?
6. What internal controls are in place to prevent an incident such as this from occurring in your company? Do you have the surveillance equipment and records management process that would support a thorough investigation such as this one? Are you comfortable with the testing of your internal mock recall plans?

**Local Water Utilities, State Drinking Water Primacy Agency, and State/Local Health and Agriculture Departments**

1. How long would it now take to get definitive laboratory identification for the contaminant in the water?
2. Would you change the water use advisory once the contaminant was identified?
3. What if the contaminant in this scenario was identified as a contaminant not regulated by the Safe Drinking Water Act?
4. What is the plan for rehabilitating the water distribution system in the industrial park? Is it safe or allowable to flush water into the street drains in this example?
5. Who certifies that the water mains are “clean” again and safe to use to distribute water?
6. What is the protocol if the incident was determined as an intentional contamination incident and law enforcement established the area as a crime scene, limiting access and ability for sampling?

**Federal Agencies (FDA, USDA FSIS, EPA)**

1. How do media relations work and who speaks to the media? What about the use of social media?
2. Who would analyze samples, using what media, looking for what, and how long would it take to get the results? How are lab results shared? What lab capabilities can each agency bring to the table?
3. What coordination needs to take place between EPA and FDA in regards to Emergency Support Functions (ESF) #8 (Public Health and Medical Services) and #11 (Agriculture and Natural Resources)?
4. What coordination needs to take place between FDA and USDA FSIS in regards to ESF’s #8 and #11?
5. How would a long term “Do Not Use” notices affect the deli meat processor? The medicated chicken feed plant? The bagged salad facility?

# Wrap-Up Activities

We will spend the remaining time synthesizing what we discussed today, identifying important action steps to include in the After-Action Report and Improvement Plan (AAR/IP) and obtaining your feedback on the overall exercise. An AAR/IP is an important tool used to evaluate the exercise addressing outcomes, strengths, weaknesses, and lessons learned. The facilitator will let you know when to expect to receive the final AAR/IP. The AAR/IP should be treated as a “For Official Use Only” document and only shared with those having a need to know.

At your table, please take a few minutes to discuss the questions below, as directed by the facilitator. We will then take some time as a large group to identify common themes and takeaways. At the conclusion of this discussion, we ask that you complete the feedback form that will be provided by your facilitator.

1. What is the most important thing you learned today in terms of managing a contamination incident that impacts the food and agriculture and water sectors?
2. What information do you need to make informed decisions during such an event? If you don’t have that information, how do you get it or what needs to be done to make a decision without it?
3. Do you think this exercise will prompt your organization to evaluate your protocols, policies, and procedures?
4. What top three actions should be taken to ensure proper event management based upon what you have learned from this exercise?
5. What went right and what can you improve on at each stage of the contamination investigation?
6. What are the roles and responsibilities of the various industry, public health, water, regulatory, and laboratory communities engaged in this investigation?
7. What could be done through all phases to reduce the time from the first indication of the incident, to implementation of effective controls, to final resolution in order to protect public health and reduce the economic impact on the entire industry?
8. What are some key lessons related to risk communication that you discussed today? What can you commit to doing to ensure that your organization supports a consistent, multi-jurisdictional, science-based message in the event of a contamination incident?
9. At any point during the investigation did you consider that contamination might have been intentional? How would this have changed the investigation?

# Appendix A: Resources

CDC. National Outbreak Reporting System. Guidance document for NORS users. <http://www.cdc.gov/outbreaknet/pdf/NORS_Guidance_5213_06232009%28compliant%29.pdf>

CDC. Multistate outbreak of *E. coli* O157:H7 infections from spinach. <http://www.cdc.gov/ecoli/2006/september/>

CDC. Foodborne Outbreak Investigations. <http://www.cdc.gov/outbreaknet/investigations/investigating.html>

CIFOR manual; Diagnosis and Management of Foodborne Illnesses: A Primer for Physicians and Other Health Care Professionals <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5304a1.htm>; <http://www.cifor.us>.

EPA Public Notification Handbook. <http://www.epa.gov/ogwdw/publicnotification/pdfs/guide_publicnotification_pnhandbook.pdf>

EPA Planning for an Emergency Drinking Water Supply

<http://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=520519>

EPA Water Security Handbook

<http://www.epa.gov/watersecurity/pubs/water_security_handbook_rptb.pdf>

Epi-Ready Foodborne Illness Response Strategies <http://www.neha.org/epi_ready/>

Hedberg, CW et al. 2008. Timeliness of enteric disease surveillance in 6 US states. Emerging Infectious Disease. 14(2):311-313

IAFP. Procedures to Investigate Foodborne Illness <http://www.foodprotection.org/files/other-publications/procedures-forms.pdf>

# Appendix B: Acronyms Used

**AAR** After-Action Report

**AAR/IP** After-Action Report and Improvement Plan

**CDC** Centers for Disease Control and Prevention

**CFSAN** FDA Center for Food Safety and Applied Nutrition

**CIFOR** Council to Improve Foodborne Outbreak Response

**CVM** FDA Center for Veterinary Medicine

**EPA** Environmental Protection Agency

**ESF** Emergency Support Function

**FDA** Food and Drug Administration

**FDECS** FDA CFSAN Food Defense and Emergency Coordination Staff

**HSPD** Homeland Security Presidential Directive

**SITMAN** Situation Manual

**TTX** Tabletop Exercise

**USACE** United States Army Corps of Engineers

**USDA FSIS** United States Department of Agriculture Food Safety Inspection Service

**WARN** Water and Wastewater Agency Response Network