

Emergency Response Planning Guidance

for Kansas Public Water Supply Systems



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KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT

Emergency Response Planning Guidance for Kansas Public Water Supply Systems

Updated February 2013

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Introduction and Purpose

The purpose of this document is to provide guidance for developing or revising public water supply system Emergency Response Plans (ERPs). An ERP is a documented plan that describes the actions that a Public Water Supply System (PWSS) will take in response to major emergency events. Emergency water supply plans are necessary for PWSS to provide adequate potable water during emergency conditions and restore normal service quickly following an emergency event. Emergency conditions may develop as a result of natural or man-made catastrophes. This guidance document will serve to familiarize water professionals, especially those responsible for PWSS serving populations of fewer than 3300, with the major components of emergency response plans.

All PWSS must develop emergency response plans as required by KAR 28-15-18 and authorized by KSA 65-171m. The overall structure of this document is directed towards an all hazards response. Emphasis is given to a methodology to assess the risk to small PWSS infrastructures from terrorist threats, sabotage, vandalism and natural phenomena. An overview is provided on how to improve physical protection systems (PPS) to insure the continued provision of safe drinking water. Additionally, the incorporation of action plans in ERP's is discussed.

Protecting public health is the primary goal of community drinking water systems. Having an up-to-date and workable emergency response plan helps achieve this goal in a crisis situation. Emergency response plans for PWSS include several components, all designed to insure an immediate response can be made to meet the needs arising from an emergency situation. An emergency response plan includes both pre- and post-emergency plans of action. The former plan includes completion of a vulnerability assessment (VA). The pre-emergency plan is the mitigation and preparedness part of emergency management. The post-emergency plan involves the systematic response to an emergency event, resulting in the resumption of normal operations of the PWSS. This is the response and recovery part of emergency management. The KDHE encourages all PWSS to perform VA's. ERP's are required by the KDHE of all systems.

There are extensive resources available regarding vulnerability assessments and emergency response planning from federal and state agencies. Primary agencies are the Department of Homeland Security, Environmental Protection Agency, Kansas Adjutant General and the Kansas Department of Health and Environment. Appendix A contains the "Simplified Vulnerability Assessment Tool for Drinking Water." Appendix B offers examples of Action Plans. Appendix C offers a Pairwise Model for ranking the needs of customers. Appendix D lists KDHE District Office contacts, and Appendix

E provides the EPA “Guarding Against Terrorist and Security Threats: Suggested Measures for Drinking Water Utilities.” For security, Appendix D is only available at www.waterisac.org. Appendix F is a bullet outline of pre- and post-emergency plan topics. Appendices G and H respectively provide a list of acronyms and additional resources.

Background

Protection of public water supplies has been a major function of the Kansas Department of Health and Environment since the agency was formed in 1885. The agency's role has changed over the years as public water supply systems grew in size and number. The agency's role of adopting standards, promulgating regulations, and providing technical assistance has become well established. In 1978, the Environmental Protection Agency granted primacy to the KDHE for enforcement of the Safe Drinking Water Act. Beginning in 1982, the KDHE required public water supply systems to conduct vulnerability assessments and prepare emergency response plans.

The day-to-day management and operation of public water supply systems generally rests with local agencies, municipalities, and rural water districts. The number of public water supply systems regulated by the KDHE are 1021 (as of February 2013), and the number of service connections continues to increase. The success of PWSS is reflected by the rarity of waterborne illnesses.

Over the years, the Kansas environment has challenged public water supply systems. Natural disasters including damaging storms, drought, and flooding have been well documented. Mitigation efforts have been launched to prevent reoccurrence of the physical destruction and loss of life associated with the floods of 1903, 1951 and 1993. The emergence of terrorist threats presents a new challenge to public water supply systems to maintain public safety and confidence.

The Kansas Adjutant General has the responsibility for emergency response planning and preparedness. This responsibility is captured in the State of Kansas Emergency Operations Plan. The State Emergency Operations Plan delineates expectations and coordinates state and local agencies responding to emergency events. Local emergency response plans, required by law, detail specific response actions local officials will invoke. In the event of a Presidential Declaration of Emergency, the National Response Plan would be activated to coordinate response activities of agencies at the federal level.

History has shown public water supplies will continue to be threatened by the Kansas environment. Terrorist actions of recent times warn of the need to be vigilant in assessing threats and reducing risks of manmade disasters. Regardless as to the source or cause of a disaster, it is in the best interests of public water supply systems and Kansas citizens to plan and prepare for emergency events.

Pre-Emergency Plan

Emergency Organization

Emergency Response Plan Design Team

Successfully responding to an emergency event is largely dependent on pre-emergency planning by management staff of the public water supply system (PWSS). The management staff of PWSS will vary in number from one or two individuals with multiple responsibilities, to large organizations with many individuals contributing to the mission of the organization. Regardless of the size of a PWSS, there are commonalities when planning for and managing an emergency event.

All PWSS should form an Emergency Response Plan Design Team. An Emergency Response Lead (ER Lead) should be designated and responsible for coordinating the design team and managing the Emergency Response Plan (ERP). The ER Lead will be the main point of contact and decision-maker during a major event. This person will have responsibility for evaluating incoming information, managing resources and staff, and deciding on appropriate response actions. The ER Lead will also have the responsibility of coordinating efforts with emergency response partners.

The design of the ERP and resulting Physical Protection System (PPS) is dependent on the community at large from citizens to utility administrators. It is important to establish a design team that crosscuts the community to some degree. Obvious design team members include PWSS staff, first responders and local law enforcement agencies, but the partnerships needed for an effective system are much broader. A design team for a small PWSS will consist of all those who can contribute to the successful design of an ERP and PPS. Design teams for extremely small systems may consist of a few individuals with broad responsibilities, whereas, teams for larger systems may consist of a number of subcommittees dealing with specific issues. An all-inclusive approach to developing partnerships builds confidence that roles and responsibilities will be understood and carried out during an emergency event.

Consider including the following individuals and organization representatives.

- City/County personnel - mayor and city manager, commissioners, rural water board members, legal counsel, planners, water plant superintendent, wastewater plant superintendent, public works superintendent, health officer,

city/county clerk, related maintenance personnel, chief of police, sheriff, fire chief, local emergency planning committee coordinator, HAZMAT coordinator, hospital administrators, long term health care providers, animal shelters, and librarian.

- State/Federal - KDHE District Engineer, Ks. Department of Agriculture, Highway Patrol, Ks. Department of Transportation, Ks. Division of Emergency Management Homeland Security Regional Coordinator, Ks. Department of Wildlife and Parks, Social and Rehabilitation Services, KBI, and US Army Corps of Engineers (USACE).
- Community representatives - school principals, industrial and service club representatives, doctors, dentists and veterinarians, amateur radio/CB clubs, Red Cross, print and broadcast media, chamber of commerce and interested citizens.
- Rural personnel - industry representatives, irrigators, haulers, and township fire chiefs.
- Neighboring communities - city and county emergency coordinators, and representatives of neighboring PWSS.
- Suppliers for key PWSS equipment, parts and chemical needs.

The design team will identify their chain of command, command post locations, list of members and alternates with need-to-know identities along with contact information for each. Regardless as to their individual or organizational involvement, each entity that may have a role in the ERP will at a minimum have contact information for the Emergency Response Lead and the Alternate Lead. The ERP should include:

Name of ER Lead	Name of Alternate ER Lead
Work Telephone No.	Work Telephone No.
Home Telephone No.	Home Telephone No.
Cell Phone No.	Cell Phone No.
Pager No.	Pager No.
Radio Call No.	Radio Call No.
E-Mail address	E-Mail address

The ER Lead or the Alternate ER Lead will need to be reachable 24/7.

Incident Command

Use of the Incident Command System (ICS) is recommended for managing an emergency event. Briefly, ICS is the model tool for command, control, and coordination of an emergency response and provides a means to coordinate the efforts of first responders as they work toward the common goal of stabilizing a major event and protecting life, property, and the environment. ICS uses a well-defined command structure in order to specify roles and responsibilities in responding to a major event.

When using the ICS, the main contact person and decision-maker is the Incident Commander (IC). At the PWSS level, the ER Lead has the role of Incident Commander, unless the incident is of such significance that local, state, or federal officials take over the command. The KDHE, Director, Division of Environment assumes the role of IC for the Division of Environment. The person designated as the Incident Commander may shift from person-to-person and agency-to-agency as situations progress through an emergency event. The changing of IC should be done smoothly with roles and responsibilities clearly understood. The design team should address roles, responsibilities, and the command structure when forming the partnerships with key organizations.

The Department of Homeland Security (DHS) is implementing the National Information Management System (NIMS) for coordinating federal, state and local responses to terrorist events. The NIMS uses the ICS. More information on ICS can be obtained from FEMA at <http://training.fema.gov/EMIWeb/IS/is195.asp> and www.dhs.gov.

Cooperative Agreements

Working relationships established through an effective design team will lead to opportunities to share resources. Cooperative agreements or mutual aid agreements such as KSMAP (Kansas Mutual Aid Program for Utilities) should be considered with other PWSS for obtaining alternate water sources, exchange of equipment and repair parts, and sources of processing chemicals. Protecting assets of a PWSS in advance of any actual threat, through cooperative agreements, is encouraged.

The ERP should identify equipment that can significantly lessen the impact of a major event on public health, and protect the safety and supply of drinking water. Based on the findings of the vulnerability assessment (VA), the ERP should identify how and where to find equipment, replacement parts, and chemicals needed to respond adequately to a particular threat. The ERP should contain an inventory of equipment on-hand (e.g., pumps); repair parts; chemical supplies for normal maintenance and operations; and details on mutual aid agreements. Mutual aid agreements with other PWSS should

be used to provide redundancy for essential equipment, parts, and chemicals not maintained in inventory.

Vulnerability Assessment (VA)

Purpose

Vulnerability assessments (VA's) help PWSS evaluate susceptibility to potential threats and identify corrective actions that can reduce or mitigate the risk of serious consequences. A properly conducted VA will identify natural and man-made threats; the potential targets of threats; the degree of risk from threats, and the level of protection provided by existing PPSs.

Threats may be from vandalism, insider sabotage, or terrorist attack. Threats to PWSS may also be caused by human error, acts of nature and loss of services. Vulnerability assessments for water systems take into account the vulnerability of the source water, transmission, treatment, and distribution systems. VA's also consider the impacts on the surrounding community related to attacks on the water system. An effective vulnerability assessment serves as a guide to a water utility by providing a prioritized plan for security upgrades, modifications of operational procedures, and policy changes to mitigate the risks and vulnerability to a utility's assets. The vulnerability assessment provides a framework for developing risk reduction options and associated costs. To ensure security objectives are being met, water systems should review their vulnerability assessments periodically to account for changing threats or system modifications.

Determine Risks

Preferably, a vulnerability assessment is a risk-based analysis evaluating the susceptibility and the probability a threat may materialize and disrupt operation of a PWSS. Vulnerability assessments can be qualitative or quantitative. Each involves the evaluation of risks associated with potential threats to a PWSS. Also, each includes an assessment of the existing PPS's ability to be successful in defending against the threats.

Once the greatest risks are identified, the water supply ER Lead and the ERP Design Team can evaluate which deterrents can be added to the PPS to reduce the risk where they will provide the greatest impact. By addressing the highest relative risk first, the system should achieve maximum benefit for resources expended. The vulnerability assessment will also help to identify those areas where risk is acceptable and can be planned for via the PWSS's ERP.

The following are basic elements of vulnerability assessments common to all PWSS.

- Characterization of the water system, including its mission and objectives;
- Identification and prioritization of adverse consequences to avoid;
- Determination of critical assets that might be subject to emergency situations that could result in undesired consequences;
- Assessment of the likelihood, qualitative probability, of such emergency situations,
- Evaluation of existing countermeasures; and
- Analysis of current risk and development of a prioritized plan for risk reduction.

The vulnerability assessment process will range in complexity based on the design and operation of the PWSS. The nature and extent of the vulnerability assessment will differ among systems based on a number of factors, including system size, potential population affected, source water, treatment complexity, system infrastructure and other factors. An effective VA will identify threats that may impact a PWSS, the specific targets or assets that may be impacted, the relative risks of the threats, and the ability of the PPS to limit adverse outcomes of emergency situations.

The manner in which the vulnerability assessment is performed is determined by each individual water utility. Remember, throughout the assessment process, the ultimate goal is twofold: safeguard public health and safety, and reduce the potential for disruption of a reliable supply of pressurized water.

Public water supply systems serving populations of more than 3300 persons are required to conduct vulnerability assessments and prepare or update emergency response plans in accordance with the federal Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Bioterrorism Act).

Resources for conducting Vulnerability Assessments –
The KDHE, Division of Environment, Bureau of Water has prepared the “Simplified Vulnerability Assessment Tool for Drinking Water”, Appendix

A. The EPA has a number of resources at its web site:

<http://water.epa.gov/infrastructure/watersecurity/>

Response to Vulnerability Assessment Findings

The results of the VA will indicate the vulnerability of the PWSS to identified threats and the level of security offered by the existing PPS. If the existing PPS has not been up-dated since 9-11-2001, it likely will need to be revised to address terrorist threats. The PPS should address deterrence, detection, delay, and response provisions to mitigate terrorist threats and actions. Action plans should be developed for high consequence events that cannot be completely prevented by the PPS. Action plans are discussed in the Post-Emergency section of this document.

Assets

The assets of a PWSS are the components of the infrastructure needed to make the utility function. Assets include:

- Physical plant
- Cyber structure
- Knowledge base
- People
- Customers

A thorough characterization of each of these categories is crucial. Omission of an essential component could result in the failure of the PWSS. The KDHE District Engineer may be contacted for assistance in identifying PWSS assets.

Physical Plant - This includes the infrastructure associated with water sources, treatment, storage and distribution of the water, and other infrastructure that supplement the PWSS. The latter includes equipment and supplies from individual, commercial, industrial or other government sources water resources. PWSS infrastructure includes land, outdoor structures and buildings with various utilities such as heating, ventilation, air conditioning (HVAC), electric power, gas and other fuels, water and communication systems and security systems, equipment and supplies for processes, pumps, storage and water distribution, maintenance operations, laboratories, transportation, environmental protection, fire and police protection.

Cyber Infrastructure - This includes the Supervisory Control and Data Acquisition (SCADA) system as well as other information technology support for the PWSS and the PPS along with their applications to all aspects of the operation, monitoring and maintenance of the two systems. Although part of the physical plant, information technology is listed separately because of its vulnerability to cyber threats.

Knowledge Base - This includes the business-critical and O&M related information including personnel, customer, government and procurement records; technical reports; as-built drawings, site plans and maps; operating, safety, environmental, conservation, drought and other emergency procedures, O&M manuals, deeds, legal agreements and contracts. During an emergency event, basic technical information needs to be readily available for PWSS personnel, first responders, law enforcement, repair contractors/vendors, the media, and others. The information needs to be clearly documented and readily

accessible. The location of critical documents, such as distribution maps, detailed plan drawings, site plans, source water locations, and operations manuals, should be identified and readily available during a major event. Much of this information would have been located and reviewed while conducting a vulnerability assessment.

People - People are the most important asset of a PWSS since the physical plant has to be managed, operated and maintained every day of the year. PWSS employee requirements must be identified and their needs met in order to insure the most cost efficient use of the physical plant and to adequately design a PPS. Also, requirements should exist for people who have access to the PWSS, but are not employees. This includes contractors, vendors or suppliers, visitors and other persons. People related asset categories include:

- Human resource policies - Policies should exist for employment including background checks before hiring and periodic criminal checks after employment. Policies should be written for non-employees defining on-site restrictions and responsibilities. These policies may vary with regard to threat level.
- Personal identification - Identification requirements should exist for employees and non-employees.
- Training - Training programs to prepare employees for their assigned tasks should be identified including personal safety and CPR.

Customers – Customers, the recipients of the treated water, are considered a separate asset because they are physically connected to the system with a potential to violate the PWSS. Customers include individuals as well as industrial, commercial and agricultural entities.

Asset Information

During a major event, basic technical information about the PWSS's assets needs to be readily available. Asset information needs to be clearly documented and readily accessible so staff can find and distribute it quickly to those who may be involved in responding to the major event.

Basic asset information that may be presented in an ERP include:

- Public Water Supply System (PWSS) ID, Owner, Administrative Contact Person, and Alternate Administrative Contact Person;
- Population Served and Service Connections;
- Distribution Map;
- Pressure Boundary Map;

- Overall Process Flow Diagrams;
- Site Plans and Facility “As-Built” Engineering Drawings
 - Pumping and Storage Facilities
 - Reservoirs and Retention Facilities
 - Water Treatment Facilities
 - Booster Pump Stations
 - Pressure-Regulating Valve (PRV) Sites
 - Distribution System, Process and Instrumentation Diagrams
 - Equipment and Operations Specifications
 - Emergency Power and Light Generation
 - Maintenance Supplies
- Operating Procedures and System Descriptions including back-up systems and interconnects with other systems;
- Supervisory Control and Data Acquisition (SCADA) System/Process Control Systems;
- Communications System Operation;
- Site Staffing Rosters and Employees’ Duties and Responsibilities; and
- Chemical Handling and/or Storage Facilities and Release Impact Analyses (i.e., chemical releases into air or water).

It is important to note that not all of the above technical information may be needed in ERPs for each PWSS. The level of technical documentation should reflect the complexity of the PWSS.

Physical Protection System (PPS)

Physical protection systems (PPSs) are intended to mitigate or lessen the impact of threats to PWSS. Naturally occurring threats and certain man-made threats have been recognized for many years and PPSs may be in place in anticipation of these threats. Existing PPSs may need upgrading to be protective against terrorist threats. Cyber security, contamination from bioterrorism, and radiological threats may not be adequately addressed in PPSs designed prior to September 11, 2001. Findings of a properly conducted VA will determine the upgrades or changes needed in the existing physical protection system.

Protecting PWSS facilities, equipment and vital records is essential to restoring operations once a major event has occurred. The ERP should identify measures and procedures that are aimed at securing and protecting PWSS following a major event. The PPS should address the following issues:

- Deterrence - Measures directed at mitigating a threat or reducing the risk of an event to an acceptable level.
- Detection - A combination of inspection, electronic surveillance, testing and warning systems capable of discovering a compromised PPS.
- Delay - the PPS serves to impede malevolent attacks. Effective delays may in themselves prevent a terrorist attack from being fully carried out.
- Response - Action plan implementation directed towards mitigating the threat or resolving the event.

Again, the findings of the VA will dictate how and in what degree the PPS will need to address the above four areas of concern.

If a threat becomes an emergency event, consideration needs to be given to the following:

- “Lock down” procedures
- Access control procedures
- Establishing a security perimeter following a major event
- Evidence protection measures for law enforcement in case the major event is declared a crime scene
- Securing buildings against forced entry

The EPA has prepared “Guarding Against Terrorist and Security Threats: Suggested Measures for Drinking Water Utilities” Revised August 2004. Guidance is provided recommending measures directed towards Detection, Preparedness, Prevention, and Protection of the PPS related to the DHS, Homeland Security Advisory system. This document is available at the Water ISAC website www.waterisac.org.

Emergency Water Requirements

A responsibility of the PWSS is to provide quality water in quantity. When an emergency occurs, an alternate water supply may be needed. Alternate water sources could include potable water from a nearby PWSS or untreated water from industrial or agricultural sources. Bottled water from commercial suppliers offers temporary, but limited, relief and could be arranged in advance or after an emergency.

Consideration must be given regarding the amount of water needed for short-term (hours to days) and long-term (weeks to months) outages. The ERP should identify the alternate water supplies available for both types of outages. Alternate sources may be provided for in cooperative agreements as discussed later. In any case, there should be a clear understanding of the water distribution system, demand requirements, capabilities of other regional PWSS, including an understanding of interconnection agreements. These are important issues that impact both the quantity and duration of alternate water supplies that could arise if multiple PWSS are affected.

The ERP should address the potential effects of power outages. For extended power failures, the plan should include contingencies for back up power generation and alternative power sources.

Alternate Sources

If a PWSS is not capable of going back on line for an extended period of time, a long-term alternate supply will be needed. It may be necessary for connection to an existing municipal or private water supply; connection with a new uncontaminated groundwater or surface water source; development of new water distribution system and storage facilities to compensate for loss of existing system capacity. These options assume the existing water treatment plant is intact and useable. Any of these major changes will require review and approval by the KDHE, Bureau of Water.

The ERP should identify agencies or private companies that could provide water (bottled or bulk) in the event of a major event. Provisions for bottled or bulk water should be established by mutual aid agreements with surrounding communities, industries, contractors and related utilities as appropriate. Points of contact for the alternate sources need to be updated routinely.

Other potential sources for short-term alternate water supplies include, local retailers, distribution warehouses, National Guard, federal emergency

response agencies, private wells, water storage facilities at hospitals, universities and industrial facilities.

Local businesses such as dairies, well drillers, irrigation supply firms, or distributors may have tank trucks that can be made suitable for carrying water, chlorinators, generators, and pipe that can be used to extend water supply lines. Other water utilities in the area may have spare parts (such as valves, pumps, and pipe) available for use in an emergency. Federal Emergency Management Agency (FEMA), USACE, and the State Fire Marshal may be able to provide or arrange for firefighting equipment. Coordination for obtaining alternate sources and emergency equipment can be coordinated through KSMAP (Kansas Mutual Aid Program for Utilities), additional assists can be requested through KDHE District Offices or the Bureau of Water in Topeka.

Water Use Advisories and Orders

Disruption in service may be a result of contamination. If contamination is suspected or confirmed, the KDHE requires issuance of water use advisories such as “boil water,” “do not drink,” or “do not use.” If a “boil water” notice is issued, no alternative water source is needed. If a “do not drink” order is issued, then the suspect water can still be used for other purposes that do not involve ingestion of the water. In this situation, it will only be necessary to provide an alternate drinking water supply for consumption and food preparation. A “do not use” order is much more restrictive and an alternate water source will need to be utilized for consumption, hygiene, and emergency needs. A “do not use” notice may also have implications for firefighting. An alternate source of firefighting water, such as a pond, river or swimming pool may be necessary in this event.

Water conservation advisories are in order in emergency situations. Customers should be advised of measures to be used if an event causes a reduction in service or a “do not use” notice is issued. If an event causes a reduction in service, customers could be advised not to do laundry, use automatic dishwashers, irrigate lawns or gardens, and to limit the duration of showers. To plan for a “do not use” notice, costumers should be advised to maintain an emergency supply of bottled water in their homes.

Community Requirements For Water Under Emergency Conditions

When the normal water supply is disrupted, it is important to return service to customers in a prioritized manner. In an emergency, it is important to determine who will be with out water and for how long. Identifying customers may be an easy task for very small PWSS that have a specific

entity such as a school, residential subdivision or industrial facility as the only customer. Larger PWSS will likely have an assortment of customers ranging from agricultural needs to medical centers. With small systems the decisions for prioritizing water needs may be relatively simple. With a PWSS serving a diversity of customers it may be necessary to systematically determine a hierarchy for providing emergency water and returning to normal service during recovery. Quantity and quality requirements for selected customers must be made in advance to insure the meeting of basic human water needs for drinking, personal sanitation, group health care (hospitals, care centers and shelters), fire fighting and other needs (commercial, industrial or agricultural). Appendix C offers a pairwise matrix model for prioritizing the needs of customers at each stage of recovery.

Stages of Service

Water requirements during the recovery phase consist of four stages. Each stage requires a different level of service where each subsequent stage is an improvement until full recovery of the PWSS is achieved. Also, the availability of alternate sources should be confirmed to allow the utility to determine the amount of safe water available for the first stage of recovery.

Four Stages of Recovery

1. The **first stage** of recovery is a survival condition where potable water is available in extremely minimum quantities for the bare essentials of existence, human consumption and cooking purposes. Hospitals, care centers, and mass shelters will also require water for the same two purposes, plus additional amounts necessary for sanitation in connection with surgical procedures and bed care patients.
2. The **second stage** of recovery must be ideally attained within two days. Primary needs at this level, in addition to level one, require potable water for general sanitation purposes of all persons within the service area. Such requirements include sufficient water to service toilets and to permit washing and bathing by individuals.
3. The **third stage** of recovery begins only after the second level requirements have been increased to near normal levels for drinking, cooking and sanitation and when additional volumes of water become available. Fire protection is now possible so that property destruction can be minimized and citizens can be protected. To provide for this added demand, potable water reserves will have to be increased substantially or an alternate source of non-potable water obtained.
4. The **fourth stage** of recovery is possible as system capabilities increase due to the continued application of remedial measures. Nearly normal service is possible, which allows partial service to industrial, commercial, and

agricultural entities. This should be done for selected entities where selection is based on community requirements for production of daily essentials and quantity of water available.

Unit Water Requirements - The U.S. Department of Defense has published data on individual water requirements after a nuclear attack. Per capita figures may be used to determine in advance of an emergency the needs for each of the previously mentioned four stages of service. Also, damage assessment of a PWSS will determine the system's ability to provide safe water at each stage of recovery.

- Stage 1 – Potable water for human consumption (drinking and cooking) and sanitation of hospital equipment are the only permitted uses. Requirements are as follows:
 - Individuals: 0.5-5.0 gallons per capita per day (GPCD)
 - Hospitals and care center: 5-15 GPCD
 - Mass Shelters: 3 GPCD
- Stage 2 – Potable water for human consumption and general sanitation. Requirements are as follows:
 - Individuals: 25 GPCD
 - Hospitals and care centers: 25-40 GPCD
 - Mass shelters: 25 GPCD
- Stage 3 – Increased usage for human consumption and general sanitation plus reserves for fire defense. Requirements are as follows:
 - Individuals: 40 GPCD
 - Hospitals and care centers: 40 GPCD
 - Mass shelters: 25 GPCD
 - Fire defense reserves: Based upon past experience of the community's fire fighting demands and system ability to produce or obtain additional water.
- Stage 4 – Conditions near normal. Selective industrial, commercial, and agricultural usage is permitted. Such usage is relative to the PWSS's production capability.

Communications

Appropriate and timely communication is essential during an emergency. The ERP should identify clear communication channels for PWSS personnel, external non-PWSS entities, the public, and the media. The ERP should maintain internal and external notification lists that contain information on all appropriate entities to be contacted, including names, titles, mailing addresses, e-mail addresses, all applicable landline and cellular phone numbers, radio call frequencies, and pager numbers. In a major event, it may not be possible to use normal channels of communication. Provisions need to be made for an efficient and fail-safe form of communication when the use of normal means may not be possible. With regard to terrorist threats, a secure means of exchanging sensitive and confidential information should be available.

Emergency Notification - Call Down List

Unless a decision to call 911 is in order, the ER Lead and the Alternate ER Lead should be the first persons notified. This will activate the call-down list of members of the emergency response team as appropriate for the situation. The call-down list, or internal notification list, should clearly identify appropriate staff to be notified. Internal notification lists should include the name of the employee, work and home telephone numbers, and any other numbers at which the employee can be reached, such as cell phone, pager, or radio phone.

The external non-PWSS notification list should ensure that all appropriate first responders and affected customers or critical users are notified. The list of groups to be notified during a major event include critical users (e.g., health care facilities) and commercial and industrial customers such as those that incorporate water into their product (e.g., bottling and canning companies). Some of these users should be given priority notification due to their public health mission and because they may serve customers considered “sensitive sub-populations” (e.g., senior residential housing, child care centers, medical facilities). Specific notification procedures should be developed for these groups.

Procedures should also be established as to: 1) who should be notified, 2) when they should be notified, and 3) who is responsible to make the notifications from your PWSS. As with any emergency, the most appropriate first call may be 911. This decision likely will be made by the first person to become aware of the emergency event or threat.

Below is a short list of possible first responders and organizations that may need to be involved in an emergency event. The ERP should have contact names and necessary contact information for each of the organizations appropriate. These organizations are not listed in any particular order of preference.

Local

- Local 911
- Police
- Sheriff
- Fire
- Local Health Department
- Local Emergency Planning Committee (LEPC)
- Regional Homeland Security Coordinator
- Elected Officials
- Power Utility
- Hazardous Materials (HAZMAT) personnel

State

- KDHE Bureau of Water 785-296-5500
- KDHE after hours 785-296-1500
- KDHE District Office
- KDHE Division of Laboratory Services
- Adjutant General Division of Emergency Management
- State Office of Homeland Security
- Kansas Highway Patrol
- KBI

Federal

- FBI
- EPA Headquarters and Regional Office
- Department of Homeland Security (DHS)
- Department of Health and Human Services (HHS)
- National Response Center

Customers

- Health care facilities

- Schools
- Industrial
- Commercial

Other

- Water Information Sharing & Analysis Center

Communications with the public and media need special attention during a major event in order to provide timely, accurate, and complete information. The above lists should be updated in the ERP at least annually.

Spokesperson - PIO

Effective public and media communications is essential. A public information officer (PIO) should be designate in advance that can speak for the PWSS. The spokesperson should be someone who is knowledgeable and credible, has good communication skills, and, if possible, is not a key person needed for implementing ERP actions plans. If another organization has taken over the role of lead agency or incident command, the lead PIO may be someone external to the PWSS. The KDHE, PIO or the KDEM, PIO will likely speak for all organizations involved in a response to a major event. Field and office staff should defer questions to the designated spokesperson. However, PWSS staff should be available to deal with the media if the lead spokesperson is unavailable or requests assistance. General press releases and public water restriction notices can be prepared in advance. The key to remember is that messages must be clear, accurate, and timely.

Personnel Safety

Protecting the health and safety of staff and visitors of the PWSS as well as the surrounding community is a key priority during an emergency. During an emergency, personnel may be at risk of harm, injury, or even death. Personnel should be provided direction on how to safely implement a variety of response actions.

The ERP should have policies and procedures for personnel safety including the following:

- Evacuation Routes and Exits: Designate primary and alternate evacuation routes.
- Assembly Areas and Accountability: Designate assembly areas where personnel should gather after an evacuation and specify procedures for taking a head count and accounting for personnel.
- Shelter: Designate, the best means of sheltering in place.
- Training and Information: Train staff and personnel in evacuation policies and procedures.
- Emergency Equipment: Develop written procedures for using and maintaining emergency response equipment and personal protection equipment (PPE).
- First Aid: Train and prepare for first aid and emergency medical treatment for employees and visitors.

Training, Testing and Updating

Training provides the means to prepare and test people, procedures and equipment for emergencies. Testing of a PWSS's ERP is essential for successfully responding to an emergency event. Testing can be accomplished through orientations, drills, tabletop exercises, functional exercises and full-scale exercises. The results of testing can be used to strengthen a plan. Updating the ERP is necessary to accommodate changes in the dynamic infrastructure of PWSS and their partners.

The local emergency planning committees are excellent sources to assist in training and testing ERPs. The KDHE and the Division of Emergency Management can provide advice regarding exercises and training opportunities.

The Department of Homeland Security has developed the National Incident Management System (NIMS) available to all levels of government for coordinating emergency response. Implementing the NIMS on a national basis will require review and updating of ERP's.

Post-Emergency Plan

The goal of the Emergency Response Team (ERT) and the Physical Protection System (PPS) is to abate threats as much as reasonably possible. Typically, the initial response will be made internally within the PWSS until outside help, if needed, arrives. Each kind of threat has unique characteristics in terms how the response team interacts with the threat. It is not possible to predict the results of a threat interrupted by the response team. The results range from complete interruption of the threat, to a situation where the threat overpowers the response team, with or without outside assistance. The response team must be flexible in its approach to dealing with threats keeping in mind the goals of the PWSS. The response phase does not end until a threat and its effects are eventually eliminated.

Activating the ERP at the appropriate time is as important as having prepared and documented the ERP. In the past, emergency responses have mostly addressed natural disasters and accidents. The definition of “major event” in this guidance includes all hazards - natural disasters, accidents, and terrorist attacks. Responding to terrorist attacks requires special attention. The decision to activate the ERP should be based on the possibility and the credibility of a threat warning as well as the confirmation of an actual event.

Threat Level

The National Terrorism Advisory System, or NTAS, replaces the color-coded Homeland Security Advisory System (HSAS). This new system will more effectively communicate information about terrorist threats by providing timely, detailed information to the public, government agencies, first responders, airports and other transportation hubs, and the private sector.

It recognizes that Americans all share responsibility for the nation's security, and should always be aware of the heightened risk of terrorist attack in the United States and what they should do.

NTAS Alerts

Imminent Threat Alert

Warns of a credible, specific, and impending terrorist threat against the United States.

Elevated Threat Alert

Warns of a credible terrorist threat against the United States.

Threat Warning Evaluation

A “threat warning” is an occurrence or discovery indicating the threat of a malevolent act. Threat warnings should not be dismissed prematurely as false alarms, and should trigger an evaluation of the threat.

Once a threat warning is received, the threat evaluation process begins. The ER Lead or Alternate ER Lead should be notified immediately. Remember, it may be most appropriate to call 911 depending on the situation. The threat evaluation process is considered in three successive stages: ‘possible’, ‘credible’, and ‘confirmed’. As the situation escalates through these three stages, the actions that will be considered also change. The following describes the stages and actions that might be considered when evaluating a threat warning and activating the ERP.

Stage 1: “Is the threat ‘possible?’” Evaluate the available information to determine whether or not the threat is possible (i.e., could something have actually happened?). If the threat is possible, immediate operational response actions might be implemented. Knowing the findings of the VA could help determine if a certain threat is possible.

Stage 2: “Is the threat ‘credible?’” There must be information to corroborate the threat in order for the threat to be considered credible. For example, the information source may be highly credible, hospitals may be reporting a potential incident, or monitoring results may be unusual. Having credible information may indicate activating additional portions of the ERP, such as initiating internal and external notifications, conducting water sampling and analysis, or issuing public health advisories. At this stage, preparing to respond is essential if the threat actually leads to a major event.

Stage 3: “Has the incident been ‘confirmed?’” Confirmation implies that definitive evidence and information has been collected to establish that an incident has occurred. Confirmation of an incident may be obvious, such as structural damage to a PWSS. Confirmation of an incident should fully activate the ERP including applicable action plans.

Application of this threat decision process will vary significantly with circumstances. The ER Lead should work through the threat decision process and implement the ERP as needed. Judgment must be exercised when determining how to appropriately manage a specific threat or incident.

Activate the Emergency Response Design Team

Depending on the initial assessment of the emergency and the initial response by PWSS personnel, the ER Lead will initiate the ERP. This will involve the implementation of predefined procedures regarding: safety; damage assessment and contact of local, county, state and/or federal emergency services; emergency response, provision of services and crisis communication. It should be recognized that the emergency should not be allowed to compromise the goals of the PWSS, but if that is the case, then every effort should be made to restore the system to a safe level of operation. How this is done depends upon the damage caused by the undesired event causing the emergency. Also, the ER Lead should coordinate with designated team members responsible for various parts of the emergency plan to insure they have the resources needed to perform their assigned tasks. The ER Lead will set action priorities in consultation with other emergency response team members.

AWWA publications are available that will assist small PWSS in preparing a post-emergency plan unique to their particular situation of people, procedures and equipment.

Safety

Standard safety procedures should be used throughout the emergency response and recovery phases. Shortcuts should be avoided even though temporary loss of service may result from the use of safe practices. Sources of required safety equipment should be identified and requested to deal with specific emergencies. Anticipated available sources should be identified in an equipment inventory included in the pre-emergency planning process. Response personnel should be qualified to use and properly fitted for using necessary PPE. Personnel accidents and exposures to potentially adverse chemical, biological, radiological or environmental conditions should be reported.

Damage Assessment and Contact for Services

If damage is incurred from the undesired event, the extent of damage should be determined ASAP so that a list of needs can be established. This is where the mutual aid agreements and assistance from state and federal agencies is utilized. Using a predefined list of emergency service providers, people, equipment and/or supplies should be requested. A clear definition of the needs should be made so the appropriate services can be obtained. When there are questions about needs, those concerns should be made clear to service providers so their advice about the perceived needs can be considered. Also, if there are inadequate services available to meet defined needs, the ER Lead should be notified as to which needs will be met and how this will impact the goals of the PWSS.

Action Plans

Action Plans (APs), also known as Response Guidelines, are tailored ERPs that address specific major events. APs describe response actions for events that might occur based on specific vulnerability identified in the VA. An AP should provide a quick approach for responding to a specific major event, and it complements actions already initiated under the ERP. APs may only need one or two pages to cover specific response information since the ERP has already addressed basic emergency response steps. An AP should be an accessible (i.e., “rip and run”) document that can be detached and taken to the field by the ER Lead or designated staff. An AP should include the following basic information:

- Special notification requirements;
- Special response steps to be taken upon ERP activation; and
- Recovery actions to bring the PWSS back into operation.

The VA process, should have determined high priority vulnerabilities. Action plans will define specific actions to be taken when high priority assets have been compromised. Certain high consequence events should have APs, regardless of whether they are high-priorities identified by the VA. Actions Plans for high-priority events and threats should be considered for the following:

- Contamination of the Drinking Water;
- Structural Damage/Physical Attack;
- SCADA, Computer, or Cyber Attack; and
- Intentional Hazardous Chemical Release (e.g., release of chlorine or ammonia from storage).

Even if a VA did not identify any vulnerability, the design team is encouraged to consider contingency planning for the possibility of these events. Example Action Plans for the four intentional events listed above are included in Appendix B. These simplified examples are for guidance only and “Action Plans” should be developed specific to the needs of PWSS. Additional guidance is available from EPA’s Response Protocol Toolbox.

Using an all hazards approach to emergency response, KDHE recommends action plans be prepared for the following emergency occurrences:

- Flooding
- Drought

- Tornados
- Severe Weather - snow, ice, temperature extremes, lightning
- Power outage
- Mechanical Failure
- Water Supply Interruption
- Contamination
 - Source water
 - Distribution system
 - Storage
 - Backflow
 - Cross connection
- Earthquake
- Radiological isotope contamination
- Contaminated Water Treatment Chemicals
- Chemical spill
- Fire
- Construction Accidents
- Personnel Problems - loss of operator, medical emergencies
- Vandalism
- Waterborne disease outbreak.

Natural Disasters and Other Significant Events

Natural Threats

Historically, PWSS in Kansas have suffered damage caused by phenomena of nature. These events include those characterized by the rapid release of enormous quantities of energy such as floods, tornadoes, damaging winds and lightning, and those that occur over long periods of time and extremes in temperature. All such natural events may create an adverse effect upon PWSS.

- Flooding - Flooding associated with major rivers is expected in spring, although the 1951 flood occurred in July. Flooding of small streams may occur at any time as the result of a locally heavy rainfall or rapid snowmelt. Flash flooding may accompany both of these rainfall events. Major PWSS problems created by flooding are:
 - Structural damage to supply, distribution system and treatment facilities.
 - Loss of power generation station or electrical transmission components.
 - Contamination of wells and treatment plants.
 - Additional loading on treatment works due to high turbidity of surface water supplies.
 - Limited access to various portions of system.
- Tornadoes and Thunderstorms - Weather conditions suitable for the propagation of tornadoes or high winds and lightning generally associated with thunderstorms are readily predictable. However, their actual occurrence may be without significant warning. The maximum period for these threats in Kansas occurs during the period of April through September. Kansas is geographically situated in an area of moderately high risk for experiencing tornadoes. Also, damage to PWSS caused by thunderstorms is potentially heavy. Typical problems associated tornadoes and thunderstorms include:
 - Severe structural damage to all above ground components; treatment units, power and electrical system components, storage tanks, material stockpiles, and administrative, operation, maintenance, environmental, emergency and communication facilities.

- Severe leakage due to ruptured service lines in damaged buildings and fire hydrants broken by air-borne debris.
- Potential of high water demand for fire defense.
- Earthquakes - Earthquakes, while relatively rare in Kansas, have been experienced. Geologists classify Kansas as being within a zone of potentially minor damage resulting from earthquakes. Earthquakes usually occur with no prior warning with potential destruction or damage to both underground and above ground facilities. Potential PWSS problems include all those given for tornadoes and thunderstorms plus others unique to an underground disturbance.
- Rupture of pipelines with loss of distribution system pressure.
- Failure or damage to source and clear well reservoirs
- Fracture of deep wells creating a situation for possible contamination of underground water supply and/or total loss of wells.

Droughts - An extended drought can result in a water supply crisis. The AWWA has prepared the “Drought Preparedness and Response” Manual, M60, to deal with this threat.

Additional information on Kansas Drought Conditions are located on the Kansas Water Offices Website on Kansas Drought Update –

http://www.kwo.org/reports_publications/Drought.htm.

- A general increase in system demand as utilization of water for irrigation becomes widespread and private groundwater supplies dwindle or fail.
- A decrease in the groundwater table elevation resulting in reduced well production or failure.
- Severe reduction in stream and river flows. Surface water supplies diminish, storage reservoirs of raw water are not replenished and pollution of surface water increases as the ratio of contaminants to water volume rises.

Note: Kansas PWSS are required to have Water Conservation Plans to be eligible for low-interest loan funds from the State Revolving Loan Fund (SRF).

- Temperature Extremes - Temperature extremes of unusual duration may create water supply emergencies. Extended hot weather will increase power demands, which reduce power available to treatment and pumping installations. Furthermore, extended hot weather periods tend to increase system demands for

water. Freezing weather produces cracked and broken water mains and service connections, and may cause failures of unprotected equipment or facilities.

Failure of System Components

- Mechanical Equipment - System breakdowns involve mechanical or equipment failures within the treatment or pumping facilities. The breakdown of items such as intake pumps, chlorination units, chemical feeders, testing equipment, and structural components such as clear wells, flocculation basins, and filter beds fall into this group. Unattended mechanical devices will not maintain an efficient functioning condition indefinitely. The neglect of periodic maintenance invariably leads to reduced equipment life and unexpected failure. Occasionally, equipment that is in relatively new condition and well maintained malfunctions due to defects in the manufacturer's workmanship or design. A utility that does not have standby equipment may be crippled by equipment failures while utilities that do have the necessary standby equipment may be forced to operate at a level below their normal efficiency.
- Storage Facilities - A utility's distribution storage is also subject to failures. Metallic reservoirs may develop leaks due to corrosion when chemically active waters are stored in them and cathodic protection equipment and/or protective painting systems are not properly maintained. Standpipes with a poor history of maintenance commonly accumulate large volumes of sediment at the base of the tank. Sediment buildup can, over a period of time, block the inflow/outflow piping resulting in reduced flow. In extreme cases, the flow of water may stop completely. During wintertime climatic conditions prevalent in Kansas, standpipes and elevated storage tanks are subject to freezing. Severe freezing of the contained water could result in the rupture of the tank due to ice expansion. Vents that have become plugged with debris together with frozen overflow lines have caused tank ruptures. Foundations that crack, settle, or rotate can cause the rupture of a storage tank resulting in a major loss of stored water as well as the facility itself.
- Pipelines - Disruption of service to the general public may occur when distribution pipelines fail. Failures, leaks or complete ruptures, of metallic pipeline are commonly caused by highly corrosive water and/or soils. Improperly supported or restrained pipe sections may separate under pressure and cause leakage. Major leaks may occur when pipelines rupture due to overlying loads in excess of the design load. Pipes that do not have sufficient soil cover are subject to fracture due to freezing during extended periods of cold weather. Plastic pipes present an additional problem in freezing weather because

induced thawing used with metallic pipes cannot be accomplished in situ without pipe damage.

- Human Error - Proper training can reduce the likelihood of human error in the normal operation of a utility, but it must be realized there is no way to plan or completely foolproof a system. A sound emergency plan covering numerous anticipated emergency conditions is the best way to prepare for this type of system failure.
- Accidental Contamination - Accidental spills of toxic materials into raw water source pose unusual problems to PWSS. Industrial spills containing highly toxic chemicals, which are not removed by normal treatment processes, can rapidly infiltrate a distribution system rendering the water unfit for normal usage. Expensive and/or sophisticated techniques must be employed in spill clean-ups. These are not normally within the technical capability of the utility since most utility personnel are not knowledgeable of the requirements of chemical contamination treatment techniques. Valuable time may be required to mobilize appropriate technical personnel to the affected area to assist in the cleanup operation. The failure of a utility to act swiftly to obtain assistance could create a serious disaster.

Indirect Failures

- Power - The major source of power for most systems is electricity furnished by an outside supplier. If for some reason electrical power becomes unavailable to a PWSS, and no standby generating facilities exist, the result is almost complete operational shutdown, depending upon the volumes of water contained in elevated storage. Since most power outages are of short duration, storage will normally handle system demand until power can be restored.
- Gas and Other Fuels - Loss of heating fuel(s) can result in employee discomfort, freezing of water with resultant damage to equipment and the lack of an alternate source of energy for standby power generation.
- Process Control Facilities - Failures may result from malfunctioning telemetry or Supervisory Control and Data Acquisition System (SCADA) facilities. Faulty telemetry and SCADA equipment can provide erroneous information and control of a PWSS's operation, presenting the operator(s) with a false sense of security or a reason to initiate unnecessary emergency procedures.
- Communication - The absence of telephone or other rapid means of communication will hinder or prevent remedial measures to restore a PWSS's capabilities. For example, loss of communication at a remotely located water

plant or storage reservoir could permit contamination or water loss to become a major problem before the situation is reported.

- Unavailable services, repair personnel and materials create the possibility of PWSS failure.
- Spare Parts - The lack of spare parts will prevent the use of key equipment.
- Process Chemicals - Chemicals such as chlorine, alum, polymers, lime or soda ash, which are needed for proper treatment, can hinder or prevent the production of potable water. As a result most systems would be forced to cease operation. The few plants that could possibly shift to other treatment processes could be faced with additional demands caused by different operator skill needs and the expenses associated with the other technologies.

Intentional Threats

- Civil Disorder or Riots - Mob actions generally include destruction of both private and public property. PWSS facilities may be destroyed or their efficient operation curtailed. Personnel charged with system operation may be injured or killed resulting in the system's ability to perform in a normal manner. Subsidiary services may be unavailable, which would cripple the operations of the typical PWSS.
- Vandalism - Acts of vandalism have become a major problem in the United States. Contamination of water, significant losses of water and willful destruction of PWSS property and equipment have become real threats to the continuity of service. Acts of vandalism may also cause disruption of outside services upon which the water system must depend. Normal maintenance operations may be delayed and thrown off-schedule when water system personnel are required to take remedial action to counteract the results of vandalism.
- Terrorism - PWSS are possible targets for terrorists because a safe drinking water is essential for a quality life and many people can be affected by their activities. Terrorists can contaminate public supplies or damage PWSS components, preventing delivery of safe drinking water. Also, fear is a by-product of terrorism, causing consumers to question drinking water quality and availability.
- Strikes or Slow-downs - Labor disputes by PWSS or outside personnel could lead to system shutdown even if sufficient supervisory personnel were available to provide some measure of service, usually operational. Maintenance would necessarily suffer from lack of manpower. Major equipment failures or water main breaks would go un-repaired. Such

occurrences could impair the operation of systems, reduce the level of service and could ultimately lead to a complete shutdown of PWSS.

Responsibilities

State - The Kansas Department of Health and Environment (KDHE) is the lead state agency for technical assistance for water supply system emergencies and water supply disaster preparedness. Responsibilities of the Water Supply Section in KDHE's Bureau of Water include: development and operation of a state plan for an emergency water supply, provision of technical and other assistance during emergency situations, coordination of assistance from other government agencies, industries or private sources, and review and approval of local emergency response plans. If state response resources are exceeded by an emergency event, the Governor can request Federal assistance.

Local - In compliance with KAR 28-15-18 authorized by KSA 65-171m, "All community water systems shall prepare an emergency operations plan to safeguard the water supply for the protection of the public if natural or man-made disasters occur. Emergency operation plans shall be submitted to the department for review and approval." During water supply emergencies, the managers of local systems have the responsibility to notify the Public Water Supply Section of emergencies that may present an imminent and substantial endangerment to health. When local capabilities are overwhelmed or non-existent, the State Emergency Operations Plan will be implemented as determined by the Director, Kansas Division of Emergency Management.

Federal - A Presidential declaration of disaster will activate the resources of the Department of Homeland Security (FEMA), and other federal agencies specific to the type of event.

Plan Security

PWSS are encouraged to protect their emergency response plans from public disclosure. The emergency response plan, action plans and supporting documents containing sensitive security information should be readily accessible to authorized personnel for planning, training, and responding to emergency events. However, access to sensitive information and specifics related to intentional events should be on a need-to-know basis. The Kansas Open Records Act exempts utility ERPs from the open records provisions. In other words, ERPs are not records open to the public.

Duplicate copies of the ERP and supporting documents should be maintained at a location away from PWSS physical facilities. A duplicate copy of the ERP is necessary in the event the PWSS's facilities are inaccessible.

Appendix A

Simplified Vulnerability Assessment Tool for Drinking Water

Appendix B

Action Plans - Examples

*Water System Contamination**

Threat Warning Stage

Threat Warning Received	<u>Special actions and notifications to be taken:</u> <ul style="list-style-type: none">• Notify ER Lead or Alternate ER Lead• Record and document all information pertaining to the threat warning• Do not disturb site if the threat warning could be a possible crime scene• Return to normal operations if no further action is required (i.e., the threat warning can be explained)• Begin the “Threat Decision Process” if the threat warning cannot be explained
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Threat Decision Process Stage

Is the Threat Possible? (Stage 1)	<u>Special actions and notifications to be taken:</u> <ul style="list-style-type: none">• Notify local law enforcement• Notify State Drinking Water Primacy Agency• Evaluate threat warning and make decisions in consultation with State Drinking Water Primacy Agency and local law enforcement• Initiate basic precautionary measures:<ol style="list-style-type: none">1. Alert staff and personnel about threat warning2. Prepare additional notification lists if the situation escalates to the “Is the Threat Credible?” stage
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If the threat is not possible, then return to normal operations. Otherwise, proceed to “Is the Threat Credible” stage.

Is the Threat Credible? (Stage 2)	<u>Special actions and notifications to be taken:</u> <ul style="list-style-type: none">• Activate notification and personnel safety portions of ERP• Evaluate whether the threat is credible in consultation with assisting agencies• Visually inspect physical evidence and determine whether there is a change in normal system operating parameters (i.e., chlorine residuals, turbidity, odor, color, pH, etc.)• Conduct actions and testing as recommended by monitoring and sampling experts
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If the threat is not credible, then return to normal operations. Otherwise, proceed to “Has the Threat been Confirmed” stage.

Has the Incident Been Confirmed? (Stage 3)	<u>Special actions and notifications to be taken:</u> <ul style="list-style-type: none"> • Initiate full ERP activation • Follow State Incident Command System • Isolate portion of system or backflush • Shut down system if obvious or confirmed contamination warrants • Issue public notice and issue follow-up media press releases • Continue sampling and water monitoring • Assess need to remediate storage tanks, filters, sediment basins, solids handling, etc.
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Structural Damage/Physical Attack to Water System or Facility(ies)*

Threat Warning Stage

Threat Warning Received	<u>Special actions and notifications to be taken:</u> <ul style="list-style-type: none"> • Notify ER Lead or Alternate ER Lead • Record and document all information pertaining to the threat warning • Do not disturb site if the threat warning could be a possible crime scene • Return to normal operations if no further action is required (i.e., the threat warning can be explained) • Begin the “Threat Decision Process” if the threat warning cannot be explained
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Threat Decision Process Stage

Is the Threat Possible? (Stage 1)	<u>Special actions and notifications to be taken:</u> <ul style="list-style-type: none"> • Notify local law enforcement • Notify State Drinking Water Primacy Agency • Evaluate threat warning and make decisions in consultation with State Drinking Water Primacy Agency and local law enforcement • Initiate basic precautionary measures: <ol style="list-style-type: none"> 1. Alert staff and personnel about threat warning 2. Heighten security at critical facilities 3. Prepare additional notification lists if the situation escalates to the “Is the Threat Credible?” stage
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If the threat is not possible, then return to normal operations. Otherwise, proceed to “Is the Threat Credible” stage.

Is the Threat Credible? (Stage 2)	<u>Special actions and notifications to be taken:</u> <ul style="list-style-type: none"> • Activate notification and personnel safety portions of ERP • Physically secure water system facilities • Evaluate whether the threat is credible in consultation with assisting agencies
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If the threat is not credible, then return to normal operations. Otherwise, proceed to “Has the Threat been Confirmed” stage.

Has the Incident Been Confirmed? (Stage 3)	<u>Special actions and notifications to be taken:</u> <ul style="list-style-type: none"> • Initiate full ERP activation • Follow State Incident Command System • Deploy damage assessment team • Isolate damaged facility from rest of water system • Coordinate alternative water supply, as needed, or consider alternate (interim) treatment schemes • Issue public notice and issue follow-up media press releases • Repair damaged facilities • Assess need for additional protection/security measures
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Cyber Attack on SCADA or Operational Computer System*

Threat Warning Stage

Threat Warning Received	<u>Special actions and notifications to be taken:</u> <ul style="list-style-type: none"> • Notify ER Lead or Alternate ER Lead • Record and document all information pertaining to the threat warning • Do not disturb site if the threat warning could be a possible crime scene • Return to normal operations if no further action is required (i.e., the threat warning can be explained) • Begin the “Threat Decision Process” if the threat warning cannot be explained
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Threat Decision Process Stage

Is the Threat Possible? (Stage 1)	<u>Special actions and notifications to be taken:</u> <ul style="list-style-type: none"> • Notify local law enforcement • Notify State Drinking Water Primacy Agency • Evaluate threat warning and make decisions in consultation with State Drinking Water Primacy Agency and local law enforcement • Initiate basic precautionary measures: <ol style="list-style-type: none"> 1. Alert staff and personnel about threat warning 2. Temporarily shut down SCADA system and go to manual operation using established protocol 3. Prepare additional notification lists if the situation escalates to the “Is the Threat Credible?” stage
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If the threat is not possible, then return to normal operations. Otherwise, proceed to “Is the Threat Credible” stage.

Is the Threat Credible? (Stage 2)	<u>Special actions and notifications to be taken:</u> <ul style="list-style-type: none"> • Activate notification and personnel safety portions of ERP • Continue manual operation using established protocol • Consider whether to isolate source water • Consider whether to shut down system and provide alternate water • Evaluate whether the threat is credible in consultation with assisting agencies • Conduct actions/testing recommended by monitoring and sampling experts
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If the threat is not credible, then return to normal operations. Otherwise, proceed to “Has the Threat been Confirmed” stage.

Has the Incident Been Confirmed? (Stage 3)	<u>Special actions and notifications to be taken:</u> <ul style="list-style-type: none"> • Initiate full ERP activation • Follow State Incident Command System • Continue manual operation, source water isolation, or system shut down and alternate water supply, as appropriate • Issue public notice and issue follow-up media press releases • Make image copy of all system logs to preserve evidence • With law enforcement assistance, check for implanted backdoors and other malicious code before restarting SCADA system • Install safeguards before restarting SCADA system • Bring SCADA system up and monitor system • Assess/implement additional precautions for SCADA system
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Hazardous Chemical Release from Water System Facility(ies)*

Threat Warning Stage

Threat Warning Received	<u>Special actions and notifications to be taken:</u> <ul style="list-style-type: none"> • Notify ER Lead or Alternate ER Lead • Record and document all information pertaining to the threat warning • Do not disturb site if the threat warning could be a possible crime scene • Return to normal operations if no further action is required (i.e., the threat warning can be explained) • Begin the “Threat Decision Process” if the threat warning cannot be explained
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Threat Decision Process Stage

<p style="text-align: center;">Is the Threat Possible? (Stage 1)</p>	<p><u>Special actions and notifications to be taken:</u></p> <ul style="list-style-type: none"> • Notify local law enforcement • Notify State Drinking Water Primacy Agency • Evaluate threat warning and make decisions in consultation with State Drinking Water Primacy Agency and local law enforcement • Initiate basic precautionary measures: <ol style="list-style-type: none"> 1. Alert staff and personnel about threat warning 2. Post full-time operations personnel at the chemical treatment areas of the facility 3. Verify that monitoring, leak detection, and personal protection equipment are fully operational 4. Prepare additional notification lists if the situation escalates to the “Is the Threat Credible?” stage
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If the threat is not possible, then return to normal operations. Otherwise, proceed to “Is the Threat Credible” stage.

<p style="text-align: center;">Is the Threat Credible? (Stage 2)</p>	<p><u>Special actions and notifications to be taken:</u></p> <ul style="list-style-type: none"> • Activate notification and personnel safety portions of ERP • Physically secure water system facilities and specifically the chemical treatment areas of the facility • Identify potentially hazardous chemical(s) to appropriate assisting agencies • Based on Risk Management program and ERP, evaluate potential extent of public evacuation or shelter in place order • Evaluate whether the threat is credible in consultation with assisting agencies
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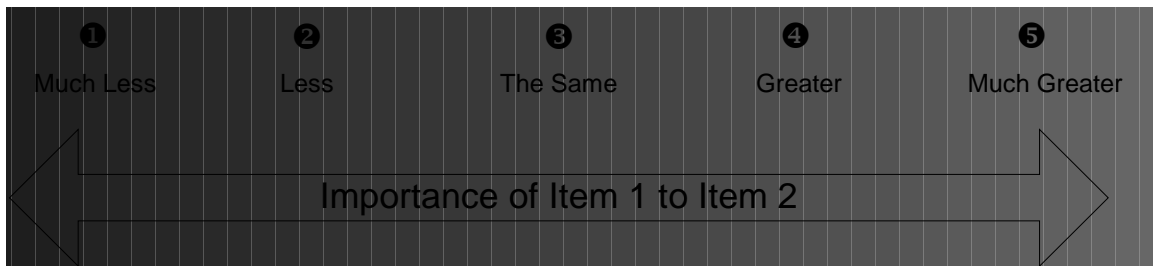
<p style="text-align: center;">If the threat is not credible, then return to normal operations. Otherwise, proceed to “Has the Threat Been Confirmed” stage. Has the Incident Been Confirmed? (Stage 3)</p>	<p><u>Special actions and notifications to be taken:</u></p> <ul style="list-style-type: none"> • Initiate full ERP activation • Follow State Incident Command System • Determine extent/concentration of chemical release and deploy damage assessment team • Turn off chemical treatment equipment and isolate chemical treatment areas from rest of water system • Depending on extent and concentration of release, issue evacuation or shelter in place order per Risk Management Program and ERP • Coordinate alternative water supply, as needed, or consider alternate (interim) treatment schemes • Issue public notice and issue follow-up media press releases • Repair damaged facilities • Assess need for additional protection/security measures
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*The above are simplified Action Plan examples that include the threat decision process to determine if the major event is just a threat or actual event. “Action Plans” should be developed that are specific to the needs of each PWSS and surrounding community.

Appendix C

Pairwise Comparison Matrix

Table 1 - Values for Ranking Criteria in Pairwise Comparison



If the Relative Importance of Item 1 to Item 2 is:		Then	The Relative Importance of Item 2 to Item 1 is:	
Much Greater	5	→	1	Much Less
Greater	4	→	2	Less
The Same	3	→	3	The Same
Less	2	→	4	Greater
Much Less	1	→	5	Much Greater

A pairwise comparison for water uses is shown in Table 2, where the water uses are for individuals, health care, shelters and others (fire fighting, commercial, industrial and agricultural). In the example in Table 2, to compare *Health Care* to *Shelters*:

1. Find ***Health Care*** in column 1.
2. Follow the ***Health Care*** row (row 2) to the ***Shelter*** column (column 4).
3. The Table indicates ***Health Care*** is a “4”, or ***of greater importance*** than ***Shelters***.

Likewise, to compare *Shelters* to *Health Care*:

1. Find ***Shelters*** in column 1.
2. Follow the ***Shelters*** row (row 3) to the ***Health Care*** column (column 1).
3. The Table indicates ***Shelters*** is a “2”, or ***of lower importance*** than ***Health Care***. It makes sense that if any generic item 1 is of greater importance than any generic item 2, item 2 is of less importance than item 1.

Table 2 - Pairwise Comparison for Emergency Water Uses, 1st Stage of Recovery

	Health	Individual	Shelters	Others	Sum
Health		3	4	5	12
Individual	3		4	5	12
Shelters	2	2		4	8
Others	1	1	2		4

Table 2 tells us that the highest importance or *weight* is placed on Health Care and Individual Use (12 each), followed by Shelters (8) and other uses (4).

Table 3 comparisons are done similarly for assumed, key limits of PWSS and include the production quantity, production quality and the geographical extent of the service area. (Note that other limits may be assumed, eg, the *President's Commission on Critical Infrastructure Protection*⁵ includes the first two along with minimum production pressure). In comparing these uses, water quality ranks first, followed by production quantity. Therefore, the goal of Table 3 is to determine the relative importance of various levels of water production.

Table 3 - Pairwise Comparison for PWSS Production Limits

	Quantity	Quality	Geographical	Sum
Quantity	-	2	4	6
Quality	4	-	5	9
Geographic	2	1	-	3

Table 4 values represent the weighted comparisons between water needs and PWSS limits. The values are determined by multiplying the importance or weighting factors from Table 2 by the production limits in Table 3.

Table 4 - Combined Pairwise Comparison, First Stage of Recovery - PWSS Limits Emphasis

	Health	Individual	Shelters	Others	Sum
Quantity	6X12=72	6X12=72	6X8=48	6X4=24	216
Quality	9X12=108	9X12=108	9X8=72	9X4=36	324
Geographical	3X12=36	3X12=36	3X8=24	3X4=12	108

A comparison of Table 4 sums indicates that production quality is the major consideration with regard to the use categories; production quantity is intermediate and geographical extent of the production is the least important. Although the same conclusion may have been reached without using the matrices, the matrix approach does emphasize the relative rank importance of quality, quantity, and distribution.

Appendix E

Guarding Against Terrorist and Security Threats - Suggested Measures for Drinking Water and Wastewater Utilities (Water Utilities).

EPA has requested this document not be placed in documents or on websites available to the general public.

www.waterisac.org

Appendix F

Outline of Pre- and Post-Emergency Topics

PRE-EMERGENCY PLAN

EMERGENCY ORGANIZATION

Identify Emergency Response Plan Design Team - Personnel from:

- Municipality
- Community
- County
- Rural providers
- Neighboring cities and counties
- Neighboring rural water districts
- PWSS suppliers
- Aviation
- State

Design Team Responsibilities

- Design of PPS
- Define chain of command
- Identify command post locations
- Define team member responsibilities
- Incident command system
- Identify need-to-know personnel
- Identify alternate personnel
- Provide contact lists including names with home and electronic addresses and telephone and fax numbers
- Define subcommittee membership and responsibilities
- Identify existing procedures

COOPERATIVE AGREEMENTS – KSMAP (Kansas Mutual Aid Program for Utilities)

- Alternate water sources via interconnections and/or hauling
 - Other PWSS
 - Rural water districts
 - Industrial
 - Irrigators
 - Commercial (bottled water)
- Alternate PWSS services
 - O&M
 - Subsidiary sources

- Laboratory
- Emergency
- Alternate supplies
- Equipment
 - Spare parts
 - Chemicals
 - Non-chemical supplies

VULNERABILITY ASSESSMENT

- Methodologies
 - Qualitative
 - Quantitative
 - Rigorous
 - Simplified (see Appendix A)
- Threats
 - Natural
 - Unintentional
 - Intentional
- Targets - fault trees for undesired events
- Risk Evaluation
 - Probability of occurrence
 - Probability of interruption
 - Degree of vulnerability
 - Severity of consequences

INVENTORY OF ASSETS

Physical Plant

- Water resources
- Transmission system
- Treatment plant
- Storage and distribution system
- Subsidiary sources
 - Electric
 - Gas
 - Other fuels
 - Chemicals
 - Equipment
- Communication
- Alternate PWSS sources for water resources, other utilities, expertise, laboratories, transportation; expertise, equipment and spare parts, chemicals and other supplies for treatment processes, maintenance, health, safety, environmental and emergency needs

- Neighboring PWSS
- Neighboring rural water districts
- Industrial
- Agricultural
- Commercial
- Governmental
- Other resources and infrastructures
 - Air and land
 - Buildings with HVAC
 - Other outdoor structures

Information Technology

- Computer hardware and software associated
 - PWSS
 - Operations
 - Monitoring
 - Maintenance
 - PPS
 - Detection
 - Delay
 - Response
 - Recovery
 - Integration of PWSS and PPS components
 - Integration with outside sources
 - Security and law enforcement
 - Private
 - Local
 - County
 - State
 - Federal
 - Regulatory
 - Local
 - State
 - Federal

Knowledge Base

- PWSS records
 - Employee
 - Customer
 - Suppliers
 - Visitors
 - Other records and information
 - Plans or procedures

- Personnel
- Procurement
- O&M
- Safety
- Environmental
- Conservation
- Drought
- Other Emergency
- Technical reports
- O&M manuals
- As-built drawings
- Maps
- Site plans
- Deeds
- Legal agreements
- Contracts

People

- Human resource policies - employee
 - Personal information
 - Job descriptions
 - Background checks
 - Periodic criminal checks
 - Union requirements
 - Benefits
 - Salary
 - Sick leave
 - Maternity leave
 - Military leave
 - Health insurance
 - Disability
 - Investment
 - Retirement
 - Life insurance
 - Human resource policies - Non-employee (contractors, vendors or suppliers, visitors and other persons)
 - Company and/or personal information
 - On-site responsibilities
 - On-site restrictions
- Personal identification
 - Personal identification number
 - Photo identification badge
 - Exchange badge

- Stored-image badge or video comparator
- Coded credential or key-card
- Personal identity verification or biometrics
 - Hand/finger geometry
 - Handwriting
 - Fingerprints
 - Eye pattern
 - Voice
 - Face
 - Other features
- Training
 - O&M
 - Safety
 - HAZMAT
 - LEPC
 - Emergency

Customers

- Addresses and contact information
- Location and connection to distribution system
- Location to other critical PWSS assets
- Intelligence information from law enforcement authorities

EMERGENCY WATER REQUIREMENTS

- Predefined minimum quantity and quality needs for predefined customers and recovery stages
 - Personal
 - Group health care
 - Hospitals
 - Care centers
 - Shelters
 - Fire fighting
 - Other
 - Commercial
 - Industrial
 - Agricultural
- Conservation plan
- Emergency treatment and distribution plans

COMMUNICATIONS PLAN

- PIO
- Call down lists
- News releases

DESIGN OF REVISED PHYSICAL PROTECTION SYSTEM

- Mitigation measures
 - Deterrence
 - Relation to threat classes
 - Difficult to assess
 - Detection
 - Relation to threat classes
 - Available sensors
 - Delay
 - Relation to threat classes
 - Available delay devices
 - Example active device
 - Response
 - Relationship to detection and delay for an intentional threat
 - Relationship to detection and delay in terms of critical detection point

PERSONNEL SAFETY

- PPE
- Evacuation
- CPR

TESTING, TRAINING AND UPDATING

- To prepare PWSS employees
- To coordinate with outside emergency personnel
- To evaluate people, procedures and equipment
- To provide a basis for the revision of:
 - Emergency responsibilities
 - Revision of plans and procedures
 - Addition or replacement of equipment

POST-EMERGENCY PLAN

- Threat level
 - Threat level preparedness (Appendix E)
- Threat Warning Evaluation
 - Possible?
 - Credible?
 - Confirmed?

- Activate the PPS design team
 - Notify team leader or alternate
 - Initiate emergency plans and procedures
 - Coordinate emergency response and recovery activities
 - Make initial assessment of damage/destruction
 - Identify needs necessary to maintain desired production levels
 - Set priorities for further action
- Safety
 - Implement safety plans and procedures
 - Avoid safety shortcuts
 - List and request needed equipment from outside sources
- Damage assessment and contact of other services
 - Confirm initial damage/destruction assessment
 - Confirm ability to produce safe drinking water
 - Confirm needs to increase production level
 - Contact outside sources to determine available resources
 - Coordinate use of resources to meet production needs
- Emergency response
 - Activate event specific Action Plans
 - Evaluate the response effectiveness in abating the threat
 - Assure that the threat has been eliminated
- Provision of services
 - Identify the level of service which can be provided without future interruption
 - Implement the changes needed to achieve the scheduled stage recovery
 - Notify KDHE of any major restructuring of facilities

RESPONSIBILITIES

- State (KDHE)
 - Provision of technical service
 - Preparation of Kansas drinking water supply emergency plan
 - Assistance to and coordination of assistance with other sources
 - Review and approval of local emergency water supply plans
- Local
 - Preparation of local emergency water supply plans
 - Approval by KDHE of local emergency water supply plans
 - Confidentiality of local emergency water supply plans
 - Notification of KDHE of emergency
 - Provision of a safe drinking water

PLAN SECURITY

- Protected by Kansas Open records Act
- Distribute on Need-to-Know basis.

Appendix G

Acronyms Used in Emergency Management

APHIS	Animal and Plant Health Inspection Service – USDA
AP	Action Plan (same as “RG” Response Guide)
AG	Adjutant General
BMP	Best Management Practices
BOW	Bureau of Water
BLM	Bureau of Land Management
CDC	Centers for Disease Control and Prevention
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERT	Community Emergency Response Team
CFR	Code of Federal Regulations
CI/KR	Critical Infrastructure/Key Resources
CMC	Crisis Management Coordinator
DEA	District Environmental Administrator
DEM	Division of Emergency Management
DFO	Disaster Field Office
DHS	Department of Homeland Security
DMAT	Disaster Medical Assistance Team
DMORT	Disaster Mortuary Operational Response Team
DO	District Office
DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy, or Division of Environment
DOH	Division of Health
DOI	Department of the Interior
DOJ	Department of Justice
DOL	Department of Labor
DOS	Department of State
DOT	Department of Transportation
DRC	Disaster Recovery Center
DRM	Disaster Recovery Manager
EAS	Emergency Assistance Personnel or Emergency Alert System
EMS	Emergency Medical Services
E.O.	Executive Order
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency

EPCRA	Emergency Planning and Community Right-to-Know Act
EPLO	Emergency Preparedness Liaison Officer
EPR	Emergency Preparedness and Response
ERP	Emergency Response Plan
ERT	Environmental Response Team (EPA)
ERT-A	Emergency Response Team—Advance Element
ERT-N	National Emergency Response Team
ESF	Emergency Support Function
ESFLG	Emergency Support Function Leaders Group
EST	Emergency Support Team
FBI	Federal Bureau of Investigation
FCO	Federal Coordinating Officer
FEMA	Federal Emergency Management Agency
FIRST	Federal Incident Response Support Team
FMC	Federal Mobilization Center
FNS	Food and Nutrition Service
FOC	FEMA Operations Center
FOG	Field Operations Guide
FRC	Federal Resource Coordinator
FRERP	Federal Radiological Emergency Response Plan
FRP	Federal Response Plan
GAR	Governor's Authorized Representative
GIS	Geographical Information System
GPCD	Gallons Per Capita Per Day
GPS	Global Positioning System
GSA	General Services Administration
HHS	Department of Health and Human Services
HQ	Headquarters
HSAS	Homeland Security Advisory System
HSC	Homeland Security Council
HSOC	Homeland Security Operations Center
HSPD	Homeland Security Presidential Directive
HAZMAT	Hazardous Material
IAIP	Information Analysis and Infrastructure Protection
IC	Incident Command or incident Commander
ICP	Incident Command Post
ICS	Incident Command System
IIMG	Interagency Incident Management Group
IMT	Incident Management Team
IOF	Interim Operating Facility
ISAO	Information-Sharing and Analysis Organization
KSMAP	Kansas Mutual Aid Program for Utilities

JFO	Joint Field Office
JIC	Joint Information Center
JIS	Joint Information System
JOC	Joint Operations Center
JTF	Joint Task Force
JTTF	Joint Terrorism Task Force
KDEM	Kansas Division of Emergency Management
KDHE	Kansas Department of Health and Environment
KHP	Kansas Highway Patrol
MAC Entity	Multiagency Coordinating Entity
MACC	Multiagency Command Center
MERS	Mobile Emergency Response Support
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NAHERC	National Animal Health Emergency Response Corps
NSA	National Security Agency
NASA	National Aeronautics and Space Administration
NAWAS	National Warning System
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NCS	National Communications System
NCTC	National Counterterrorism Center
NDMS	National Disaster Medical System
NEP	National Exercise Program
NGO	Nongovernmental Organization
NICC	National Infrastructure Coordination Center
NICC	National Interagency Coordinating Center
NIMS	National Incident Management System
NIPP	National Infrastructure Protection Plan
NIRT	Nuclear Incident Response Team
NJTTF	National Joint Terrorism Task Force
NMRT	National Medical Response Team
NOAA	National Oceanic and Atmospheric Administration
NRC	Nuclear Regulatory Commission
NRCC	National Response Coordination Center
NRCS	Natural Resources Conservation Service
NRP	National Response Plan
NRT	National Response Team
NSC	National Security Council
NSP	National Search and Rescue Plan
NSSE	National Special Security Event
NVOAD	National Voluntary Organizations Active in Disaster
NWCG	National Wildland Coordinating Group
NWS	National Weather Service
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration

OSLGCP Office of State and Local Government Coordination and Preparedness

PCC Policy Coordination Committee
PDA Preliminary Damage Assessment
PDD Presidential Decision Directive
PFO Principal Federal Official
PIO Public Information Officer
PPE Personal Protective Equipment
POC Point of Contact
PVO Private Voluntary Organization

RA Reimbursable Agreement
RACES Radio Amateur Civil Emergency Services
RAMP Remedial Action Management Program
RCP Regional Contingency Plan
RCRA Resource Conservation and Recovery Act
REPLO Regional Emergency Preparedness Liaison Officer
RFI Request for Information
RG Response Guide
RISC Regional Interagency Steering Committee
RRCC Regional Response Coordination Center
RRT Regional Response Team
ROC Regional Operations Center

SAC Special Agent-in-Charge
SAR Search and Rescue
SCC Secretary's Command Center (HHS)
SCO State Coordinating Officer
SFLEO Senior Federal Law Enforcement Official
SFO Senior Federal Official
SIOC Strategic Information and Operations Center
SNP Strategic National Stockpile (pharmaceutical)
SO Safety Officer
SOG Standard Operating Guideline
SOP Standard Operating Procedure
START Scientific and Technical Advisory and Response Team

TSA Transportation Security Administration
TSC Terrorist Screening Center
TTIC Terrorism Threat Integration Center

UC Unified Command
US&R Urban Search and Rescue
USACE U.S. Army Corps of Engineers
USCG U.S. Coast Guard
USDA U.S. Department of Agriculture
USSS U.S. Secret Service

WISAC	Water ISAC
VMAT	Veterinarian Medical Assistance Team
WAWAS	Washington Area Warning System
WMD	Weapons of Mass Destruction
WQCC	Water Quality Commission

Appendix H

Additional Resources

American Water Works Association: www.awwa.org.

Agency for Toxic Substances and Disease Registry (ATSDR): www.atsdr.cdc.gov.

AOAC - Rapid Test Kits Test Kit Database:
<http://www.aoac.org/testkits/recommendedlabs1.htm>

CDC - Emergency Preparedness and Response: www.bt.cdc.gov.

CDC - List of Select Biological Agents” <http://www.cdc.gov/od/sap/docs/salist.pdf>.

FEMA, Hazardous Materials Guide for First Responders.
<http://www.usfa.fema.gov/fire-service/hmgfr3.cfm>.

Kansas Department of Health and Environment: <http://www.kdheks.gov/>.

Kansas Municipal Utilities: www.kmunet.org.

Kansas Rural Water Association: www.krwa.net.

National Rural Water Association: www.nrwa.org.

Physician Preparedness for Acts of Water Terrorism:
www.waterhealthconnection.org/bt/index.asp.

Recognizing Waterborne Disease and the Health Effects of Water Pollution: A Physician
On-line Reference Guide: www.waterhealthconnection.org.

US EPA - List of Drinking Water Contaminants & Maximum Contaminant Levels MCLs):
<http://water.epa.gov/drink/contaminants/index.cfm/>

US EPA - Water Security Home: <http://water.epa.gov/infrastructure/watersecurity/>

US EPA - Environmental Technology Verification Home: <http://www.epa.gov/etv/>.

US EPA - Undated Compendium of Environmental Testing Laboratories.
<http://www.epa.gov/compendium>.

Water ISAC Water Security Network: www.waterisac.org.