


APHC Technical Guide 297

# Emergency Response Planning for Military Water Systems

November 2021

Public Health
Prevent. Promote. Protect.
Army Public Health

U.S. Army Public Health Center
Environmental Health Engineering Division
8072 Wise Road, Building E-1675
Aberdeen Proving Ground, MD 21010-5403

# TABLE OF CONTENTS

**Page**

**Page**

**Page**

## LIST OF TABLES



## LIST OF FIGURES



## APPENDICES

This page was intentionally left blank.

# CHAPTER 1
# WATER SYSTEM EMERGENCY PLANNING: A NEW FOCUS

## 1.1 PURPOSE AND USE OF THIS DOCUMENT

This technical guide (TG) will educate the reader on how to respond to a water system emergency on an Army installation. This TG also provides a systematic approach to develop and revise an Army water system emergency response plan (ERP) for external as well as internal installation representatives. All military installations worldwide that either purchase or treat drinking water can use this TG to prepare a water system ERP that complies with all federal and Army requirements. However, this TG is not a substitute for complying with federal, state, or Army regulations.

## 1.2 REFERENCES

Appendix A contains a list of references used to prepare this TG.

## 1.3 ABBREVIATIONS AND TERMS

The Glossary defines the abbreviations and terms used in this TG.

## 1.4 NEED FOR AN EMERGENCY RESPONSE PLAN

### 1.4.1 Summary

In accordance with (IAW) the *Public Health Security and Bioterrorism Preparedness and Response Act of 2002*, a drinking water system ERP must be developed for all drinking water systems that serve greater than 3,300 persons (reference 1). This requirement was further extended by the Department of Defense (DOD) and Department of the Army (DA) to include all U.S. military water systems that serve greater than 25 persons, anywhere in the world (references 2 and 3). The requirements defined in the *Public Health Security and Bioterrorism Preparedness and Response Act of 2002* have been reiterated and further refined in the *America's Water Infrastructure Act of 2018* (AWIA) (reference 4). Because of the new federal and military requirements, Army potable water system personnel responsible for regulatory compliance must take action.

### 1.4.2 Need for Additional Guidance for Army Water Systems

Army Regulation (AR) 420-1, American Water Works Association (AWWA) Manual Number (No.) 19, and Technical Bulletin Medical (TB MED) 576 focus on preparation and response for natural disaster-caused emergencies (references 5–7). New regulations require installations to include responses to terrorist-caused incidents in their water system ERP. As a result, the U.S. Environmental Protection Agency (EPA), other federal agencies, and water industry organizations have provided guidance though only limited guidance specifically applies to Army water supply systems because of their unique operational and management nature (references 8–15). An "All-Hazards Approach" must be used for the development of ERPs for Army

installations. The goal is to preclude, or minimize, the interruption of mission(s) at these installations. This guide provides the reader specific insight and recommendations for developing an Army water system ERP.

## 1.5 FEDERAL REQUIREMENTS

### 1.5.1 Affected Water Systems

Public Law (PL) 107-188, Title IV – Drinking Water Security and Safety of the *Public Health Security Bioterrorism Preparedness and Response Act of 2002* requires all installations with public drinking water systems serving populations greater than 3,300 persons to prepare or revise their ERP and incorporate the results of vulnerability assessments (reference 1). Similarly, PL 115-270, Title II – Drinking Water System Improvement of the *America's Water Infrastructure Act of 2018* (AWIA) (reference 4) renews the demand for an ERP subsequent to the performance of a Risk and Resilience (R&R) assessment of each Community Water System serving populations greater than 3,300 persons.

### 1.5.2 Submission Deadline

Certifications must be submitted to the EPA Administrator as defined in Table 1. As noted, the certification submission for an R&R assessment is based on the population served. The certification submission regarding the development of ERPs is required no later than six (6) months after the R&R certification submittal. Guidance for EPA certification is provided online at the EPA website. Certification may be submitted via the regular U.S. Postal Service, email, or using the online service offered at the EPA website (preferred method). Water system or Directorate of Public Works (DPW) personnel responsible for regulatory compliance should ensure that certification procedures are completed. An example of the certification letter to be submitted to the EPA is provided in Appendix B. The AWIA requires that this process be updated and repeated every five (5) years. Table 1 describes the submission deadlines in detail.

**Table 1. EPA Submission Deadlines for R&R and ERP Certification**

| Population Served | Date of Initial R&R Certification | Certification Date of Initial ERP |
|---|---|---|
| >100,000 | 31 March 2020 | 30 September 2020 |
| 50,000–99,999 | 31 December 2020 | 30 June 2021 |
| 3,300–49,999 | 30 June 2021 | 31 December 2021 |

Legend:
ERP = emergency response plan
R&R = Risk and Resilience
EPA = U.S. Environmental Protection Agency

### 1.5.3 Plan Requirements

The *America's Water Infrastructure Act* specifically requires that a water system ERP shall include, but not be limited to:

- Strategies and resources to improve the resilience of the water system, including the physical security and cybersecurity of the system;

- Plans and procedures that can be implemented, and identification of equipment that can be utilized, in the event of a malevolent act or natural hazard that threatens the ability of the community water system to deliver safe drinking water;

- Actions, procedures, and equipment that can obviate or significantly lessen the impact of malevolent act or natural hazard on the public health and the safety and supply of drinking water provided to communities and individuals, including the development of alternative source water options, relocation of water intakes, and construction of flood protection barriers; and

- Strategies that can be used to aid in the detection of malevolent acts or natural hazards that threaten the security or resilience of the water system.

### 1.5.4 Local Emergency Planning Committee Coordination

Section 2013(a)(c) requires that community water systems, to the extent possible, coordinate with their existing Local Emergency Planning Committee (LEPC) when preparing or revising their ERP. EPA's Local Emergency Planning Committees website can assist in the identification of the LEPCs. Collaborating with stakeholders like LEPCs allows all parties to understand response processes and procedures used during a drinking water incident.

### 1.5.5 Record Maintenance

Each community water system shall maintain a copy of the ERP for five (5) years after such certified plan has been submitted to the EPA Administrator. As previously stated, this process must be repeated every five (5) years.

### 1.5.6 Small Public Water Systems

A water system ERP for Community Water Systems serving a population of less than 3,300 persons is not required under the federal standards; however, installation water systems must develop an ERP to comply with DOD and Army requirements.

## 1.6 STATE REQUIREMENTS

An installation developing an ERP, should contact their state drinking water agency representatives to determine if any state water system requirements apply. Many states have specific emergency management planning guidelines, while some do not. The water system ERP should comply with all state requirements.

## 1.7 DOD AND DA REQUIREMENTS

### 1.7.1 Policy

A DOD (reference 2), as well as a DA (reference 3), policy memorandum requires that all installations with drinking water systems serving greater than 3,300 persons prepare ERPs and submit a designated certification to the EPA Administrator, as required in the AWIA. In addition, the DA memorandum requires that any installation worldwide with a water system serving greater than 25 persons prepare a water system ERP (Table 2). Submission of certifications for small systems (<3,300) to the EPA is not required. All original and copies of ERPs should remain at the installation.

### 1.7.2 Regulation

Army installations should have an emergency water supply plan IAW AR 420-1 (reference 2) as part of the Water Resources Management Plan. AR 420-1 specifically states that contingency plans should be IAW AWWA Manual No. 19 (reference 6), TB MED 576 (reference 7), and primacy state guidance. Army installations outside the continental United States are required to have a water system ERP IAW the Overseas Environmental Governing Baseline Guidance Document (OEGBD) (reference 16). The OEGBD requires that the emergency contingency plan identify key personnel; procedures to restore service; procedures to isolate damaged lines; alternative water supplies; installation public notification procedures; and conduct an evaluation of the susceptibility of the water source, treatment, storage and distribution system(s) to disruption of service from natural disasters, accidents, and sabotage.

## 1.8 POST PLAN DEVELOPMENT

### 1.8.1 Ownership

Typically, the installation DPW should maintain the original water system ERP. The DPW has historically maintained control over the operation and maintenance of potable water systems. Currently, though, many installation water systems have been contracted to commercial activities who maintain the primary responsibility for water system operations and maintenance (operating contractors).These operating contractors may control all activities associated with the water system ERP with the installation DPW. In some cases, however, the emergency operations center (EOC) may maintain the original water system ERP due to their unique mission of emergency response and management. Regardless of what organization possesses the original water system ERP, all organizations that may respond to a water system emergency should have a copy and at least one copy should be located in the installation’s EOC.

### 1.8.2 Review

Developing the ERP is a good first step in preparing for a water system emergency response situation; however, it is only information within a document. The ERP is merely a tool to be used by people. The primary users of this plan should review it prior to its completion, provide recommendations for improvement, and become familiar with its contents. The ERP should be treated as a “living” document and requires at least annual updates. If the water utility system configuration or management undergoes a major change, updates should be conducted more frequently. Once the ERP is updated, the plan should be redistributed and the older plans should be collected and destroyed.

### 1.8.3 Training

All installation personnel that may respond to a water system emergency (terrorist attack or natural disaster) should be familiar with their roles and responsibilities outlined in the ERP prior to an actual emergency. A critical step in emergency preparedness is the execution of a water system tabletop or field-level exercises. Exercises help determine the ERP’s strengths and weaknesses, and identify needed plan improvements. These types of exercises will also bring together representatives from various directorates on the installation prior to the time of an actual emergency.

## 1.9 DOCUMENT COPIES AND SUPPORT

Copies of this TG and additional support can be obtained by contacting the U.S. Army Public Health Center (APHC) Garrison Water Branch, Environmental Health Engineering Division at Water.Supply@apg.amedd.army.mil or by using commercial telephone at (410) 436-2509.

This page was intentionally left blank.

# CHAPTER 2
# DISASTER HAZARDS TO CONSIDER

## 2.1 HAZARDS

When developing an ERP, potential hazards must be considered. A hazard is a source of potential damage that interferes with the ability to deliver potable water of adequate quality, quantity, and/or pressure. The protection of human life and health is of the utmost concern, as well as the absence of interruption of the installation's primary mission(s). Natural disasters are hazards that include all emergencies except those as a result of enemy attack or civil disturbance. The following paragraphs identify the most probable natural and manmade disasters and their associated consequences.

## 2.2 NATURAL DISASTERS

### 2.2.1 Hurricanes

Hurricanes are severe tropical cyclones having sustained winds of at least 74 miles per hour or greater and are a primary threat to aboveground components of the water system (e.g., storage tanks, uncovered treatment processes). A hurricane could damage elevated storage tanks and exposed transmission lines as well as result in loss of power. Flooding can also occur due to the immense volume of rain deposited in a short period of time. Flooding could result in source water contamination or inoperability of water system treatment and pumping equipment. Water main breaks could result in the potable water system being contaminated.

### 2.2.2 Nor'easters

A Nor'easter is a violent winter storm capable of depositing large amounts of snow and rain in a relatively short period of time. Nor'easters can affect both the distribution system and the water treatment plant (WTP). Frozen ground can crack distribution system piping. Excess snowmelt could cause an overload in the WTP similar to the effect of a flood or a hurricane. Nor'easters could also affect communications, power transmission systems, and personnel thus impairing the ability of installation personnel to respond to emergencies.

### 2.2.3 Tornadoes

Whirling winds accompanied by a funnel-shaped cloud are referred to as tornadoes. Usually, tornadoes are associated with other violent weather such as thunderstorms and hurricanes. Although tornadoes can be tracked by radar, they are extremely difficult to predict and often result in high mortality rates. Tornadoes cause extensive structural damage as aboveground facilities are rarely designed to withstand tornado-force winds. Critical water system components likely to be affected include WTPs, buildings, tanks, electrical transmission lines, telemetry system components, and exposed transmission piping. Tornadoes can also disrupt administrative and operational procedures, transportation, and communications, limiting installation personnel response to emergencies.

### 2.2.4 Floods

Flooding can be caused by heavy rainfall and melting of frozen precipitation. Typically, flooding due to precipitation is easy to predict and defend against if sufficient funds are available to take preventive measures. As indicated above, flooding can be one consequence of a hurricane or Nor'easter. Excess runoff into the WTP could overload the treatment processes and contaminate the WTP. Surface water runoff due to flooding can contaminate surface water sources and ground water under the direct influence of surface water by introducing chemical and microbiological contaminants. Flooding could also result in the loss of electricity, transportation, and communications.

### 2.2.5 Fires

Forest or brush fires can occur anywhere such vegetation exists, particularly in areas affected by dry weather or drought. Structural fires on an installation can be caused by storms, accidents, or vandalism. Large forest or brush fires could damage electrical power transmission lines and distribution system equipment and disrupt communications infrastructure. A significant fire on the installation could deplete potable water supplies. Ruptured pipes in the older sections of the distribution system that would supply the water flow necessary to fight a massive fire is another consequence. Fire at a WTP could destroy telemetry equipment, repair stock, system equipment, and supplies. Any largescale fire is likely to disrupt administrative and operational procedures.

### 2.2.6 Severe Weather

Periods of harsh cold or heat, blizzards, high winds, and ice storms are some examples of severe weather. Administrative and operational procedures can be disrupted by severe weather. Severe weather can have both long- and short-term impacts on the water system. Extreme periods of low temperature conditions could freeze valves, pipes, and storage structures. Ice storms could damage power transmission lines, interrupt transportation and supply deliveries, and disrupt communication equipment. Deep snow can prevent water utility personnel from accessing treatment facilities and prevent supply deliveries. Hot weather can cause droughts and increase the threat from fire by drying out existing vegetation.

### 2.2.7 Earthquakes

Earthquakes are caused by a shift in the plates beneath the earth's surface. The resulting effect is stress and strain on structures that can result in structural failure. Structural integrity of all water system components (pipes, hydrants, buildings, basins, chemical containers) can be affected by an earthquake. An earthquake could cause main breaks, building collapses, and chemical leaks. Oscillating levels in water tanks could also cause structural damage to the support beams, possibly requiring repair work or temporary shoring.

### 2.2.8 Water Contamination

Microbiological contaminants such as viral, bacteriological, and toxicological agents can cause waterborne disease. Contamination leading to waterborne illness is often the result of some other hazard such as a tornado shattering the distribution system's piping and causing backflow into the system, but can also be the result of natural changes in the source water or cross-connection within the distribution system. Contamination by disease-causing organisms could cause a temporary disruption of water service while utility personnel isolate, disinfect, and flush the contaminated portion(s) of the system.

## 2.3 MANMADE DISASTERS

The following manmade threats present a concern by virtue of the installations' prominence within the U.S. government and the U.S. Army. Facilities and agencies located on Army installations present high value targets for terrorists. Fires, accidents, and/or acts of vandalism are also potential manmade threats.

### 2.3.1 Terrorism

Terrorism is the use of force or violence against persons or property, in violation of the criminal laws of the United States, for the purpose of intimidation, coercion, or ransom. The sabotage of a public drinking water system, or the threat to do so, is a federal offense (reference 16). Terrorism can be domestic, international, or both. Acts of terrorism targeted against an Army water system could come in the form of chemical, biological, radiological, nuclear, and explosives (CBRNE) attack. Targets could include one or more of the following: water system personnel, buildings, source components, treatment processes, chemical storage facilities, distribution system components, pumping equipment, and supervisory control and data acquisition systems (SCADA). Specific categories of terrorism upon water systems are described below:

- Malicious physical destruction of a water system asset (e.g., distribution system pipe, storage tank, pump building, or intake structure) will result in some level of installation response. In particular, destruction of parts of the distribution system piping could limit the ability to fight fires on the installation and reduce access to decontamination water supplies. Upon initial discovery of physical destruction to water system components, law authorities should be contacted immediately to assess the situation/destruction and DPW or Public Health (PH) Program personnel should not approach the facilities. Often secondary explosive devices can detonate causing a magnification of destruction and casualties. Deliberate destruction will likely involve a criminal investigation by the Federal Bureau of Investigation (FBI). Generally, local resources can handle recovery and needed system repairs from a physical destruction event when law enforcement authorities have cleared the system.

- Intentional contamination could target the water source, WTP, storage tanks, or transmission lines. Depending on the attack type, intentional contamination could be far-reaching or affect only a small portion of the water system. An assessment will need to occur to determine whether elevating the disinfectant level is appropriate for

the situation. That is, boosting the free chlorine level, if used normally, should not be immediately implemented if chemical contamination is suspected or determined. Several chemicals have been identified as producing more toxic byproducts when in the presence of chlorine. In addition, some biological agents are resistant to chlorine and will remain a threat. Recovery from an intentional contamination event will require local, state, and federal involvement and should not be handled by the installation alone.

- A cyber attack directed at the SCADA system could be launched from a location in or outside the U.S. Unlike previously mentioned threats, SCADA attacks involve persons using computers and remote electronic equipment. Results of SCADA attacks could cause overfeeding of treatment chemicals, denial of service, and phony water quality/operations readings (e.g., chlorine, pressure, pump rate).

### 2.3.2 Vandalism

The willful or malicious destruction or defacement of property is an act of vandalism. Vandals could damage water treatment facilities, pumping stations, water storage tanks, hydrants, and administrative offices. Water supplies could be intentionally contaminated or depleted. Strikes by utility personnel or other workers could result in diminished water production and supply. Strikes might also result in vandalism, sabotage, or interference with supply deliveries.

### 2.3.3 Accidents

Accidents could damage water system components and contaminate the water sources through either direct or cross-contamination. Accidents may include vehicle collisions, damage caused during construction, hazardous material spills, and aviation accidents. Spills of hazardous materials could contaminate the surface and ground water supplies. An accident at the WTP could disrupt the ability of the installation to provide and obtain potable water.

## 2.4 AGING INFRASTRUCTURE EMERGENCIES

Many Army installations were constructed to provide training and equipment production and storage to support Defense requirements over a relatively short term. Many of these facilities have remained functional for far longer than anticipated. Similar to many community water systems, age and/or natural conditions (e.g., corrosion) have compromised the integrity of this critical infrastructure. This has resulted in numerous localized water system emergencies, created by distribution system main breaks. Where prevalent, system-wide assessments should be undertaken to ensure that critical Army missions and/or public health are not imperiled by the large-scale compromise of water piping, valves, or water quality. Installation ERPs must account for the rapid response and repair of distribution system breaks (encompassing repair, flushing of soil and debris introduced, and the disinfection of lines, per EPA and AWWA guidance (references 2, 6, and 10)) and prepare for significant disruption of service interrupting missions and Public Health concerns on the installations as time passes and conditions worsen.

This page was intentionally left blank.

# CHAPTER 3
# PREPARING THE INSTALLATION FOR A WATER SYSTEM EMERGENCY

## 3.1 PREPARING FOR NATURAL DISASTERS

### 3.1.1 General Considerations

Water system emergencies are frequently caused by natural disasters. Following a natural disaster, water pipeline breaks resulting in contamination of the distribution system is a very common emergency. Once water lines are damaged, contaminated soil and water can be sucked into the water line due to low pressure. Systematic flushing is then required to remove the foreign debris. Disinfection and the issuance of a boil water advisory to notify affected customers are also required actions. Chapter 2 describes other events that cause water system emergencies.

### 3.1.2 Preparation

Army installations have experience in dealing with natural disasters. Since natural disasters can usually be forecast, installation personnel can take actions to prepare for the event. Preparations for a water system emergency can have a profound effect on the ability of the system to operate continuously and provide safe drinking water. By preparing and allocating resources to mitigate suspected consequences, the loss of life and property can be lessened.

### 3.1.3 Backup Power

If a natural disaster can be forecast, the DPW/operating contractors should ensure backup power supplies for the WTP, chemical feed equipment, and pumps are available. Specifically, power for chemical feed equipment (including disinfection) should be obtained and maintained. During power outages, safe potable water cannot be supplied to the distribution system if it cannot be disinfected.

### 3.1.4 Supplies and Equipment

Public works or the water system operations contractor should also ensure that water treatment chemical supplies are adequate. Roads at the chemical supply company or those leading to the WTP can become blocked due to law enforcement activity or road obstructions (e.g., trees and power lines). Water systems must be able to continue to operate and reach into onsite chemical supplies during emergencies (e.g., a 2-week onsite supply is recommended). Replacement piping and appurtenances also need to be available to repair the system should it be damaged. Heavy equipment such as excavators, front-end loaders, and backhoes should also be checked for operability and availability. Water sampling equipment is vital to determining whether the water is safe to drink. Some of the most frequently forgotten supplies are sample bottles and preservatives. In-house supplies (e.g., bottles and media) should be maintained in adequate quantities preceding an approaching severe weather disturbance. Supplies and equipment should be available to promote an efficient and effective response.

### 3.1.5 Chemical and Bacteriological Monitoring

Chemical and bacteriological water quality monitoring results should be scrutinized before, during, and after the hazard. Natural disasters could change the source water quality and damage facilities. Damaged facilities could allow contaminated water into the distribution system. To quickly detect a problem, the source water, WTP, and distribution system water quality sampling and analysis frequency should be increased. The disinfectant residual (e.g., free-available chlorine), pH, conductivity, coliform bacteria, and turbidity are all useful water quality indicators.

### 3.1.6 Sensory Monitoring

The DPW and/or operations contractor should monitor aesthetic water quality of the source water, water plant, and water entering the distribution system. Water that has been contaminated will likely exhibit a noticeable taste, odor, color, or decreased clarity. Water that has bypassed certain treatment processes (e.g., filtration) may also have these qualities. The DPW/operations contractor personnel should check sensory qualities of water using their sense of smell, specifically the Threshold Odor Test which is Standard Method 2150B (reference 18), and by visual inspection.

### 3.1.7 Drinking Water Consumer Surveillance

The DPW and/or operations contractor should pay particular attention to drinking water consumer complaints. Should contaminated water enter the water system consumers will likely be the first to detect it. If a distribution main breaks, low pressure and/or colored water complaints could be reported. Guidance for improving the handling of customer complaints on Army installations is contained in U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) TG 284 (reference 19).

### 3.1.8 Alternate Sources

Identifying and acquiring alternate water sources are also important preparatory actions. Storing supplies such as food and water before a natural disaster strikes can allow for responders to quickly and effectively respond and lessen the impact of the damaged water system. The Federal Emergency Management Agency (FEMA) recommends storing at least a 3-day supply of water for emergencies. Identifying local bottled water vendors and organic water production, storage, and distribution equipment prior to the natural disaster striking can help find alternate water sources.

## 3.2 PREPARING FOR INTENTIONALLY CAUSED EMERGENCIES

### 3.2.1 Attack Objectives

Terrorist and other malicious attacks against water systems can have one or more objectives. These objectives can include inciting fear into citizens, causing bodily harm, destruction of property, or simply disrupting service and/or the mission(s) of the installation. If a terrorist attack is suspected, the DPW/operations contractor should be in close contact with intelligence and

law enforcement officials. At elevated Force Protection Conditions (FPCON), the likelihood of an attack is increased. Because of the heightened threat level, persons responsible for protecting, operating, and responding to the water system emergency should consider the actions described below.

### 3.2.2 Coordination

There are certainly similarities in factors that must be considered for both natural disasters and intentionally-caused emergencies. However, the intentionally-caused emergencies will have unique factors to address. In an emergency response situation, representatives from DPW, operations contractors, installation Public Health Program, and law enforcement will find themselves shoulder-to-shoulder facing the problems. For this reason, these organizations should develop cooperative relationships and make certain that the water system infrastructure and consumers are protected.

### 3.2.3 Directorate of Public Works

The DPW/operations contractors should implement all the natural disaster preparatory actions mentioned in paragraph 3.1. These actions will increase the chances of detecting water system problems and quickly responding to a water system emergency. In addition to the aforementioned actions, DPW/operations contractors should: (1) contact the Contracting Office and mandate that all persons requesting access to fire hydrants obtain written approval from public works/operations contractors first and (2) ask installation law enforcement to prohibit access to fire hydrants without specific authorization by public works/operations contractors. Furthermore, DPW and the operations contractors should work more closely with Public Health Program to improve monitoring of distribution system water quality and investigating drinking water customer/consumer complaints.

### 3.2.4 Army Medical Activity / Public Health Program

The installation Public Health Program plays a critical role in the surveillance of drinking water quality and population health. As the medical linchpin of health protection and surveillance on Army installations, the Public Health Program should monitor patient admittances at installation health clinics and hospitals. The Public Health Program has the responsibility of determining if there are any health-related complaints linked to contaminated drinking water. The Public Health Program should work closely with the DPW and/or operations contractors to monitor distribution system water quality and investigate drinking water consumer complaints.

### 3.2.5 Law Enforcement

Installation law enforcement officials need to work closely with DPW/operations contractor personnel to protect infrastructure and detect an attack on water system assets. DPW/operations contractor personnel should familiarize law enforcement representatives with all critical water system facilities and estimate response time to each location. Should any water system asset be compromised, resident and workforce health could be at an acute health risk level. Law enforcement should coordinate water system threats or suspicious activity investigations with DPW and/or operations contractor. In addition, law enforcement units should

increase the patrol frequency of water system assets during increased threat conditions. Specific assets to survey include intake structures, well buildings, transmission lines, WTPs, storage tanks, fire hydrants, and pumping facilities. Law enforcement should also notify DPW and operations contractors if any suspicious activity is found near one of these aforementioned assets. Suspicious activity includes any equipment connected to a hydrant or persons tampering with hydrants without written approval.

This page was intentionally left blank.

# CHAPTER 4
# INTENTIONAL CONTAMINATION: OVERVIEW AND SAMPLING AND ANALYSIS CONSIDERATIONS

## 4.1 QUICK DECISIONS

In the event of an attack, decision-makers from the installation and other responding organizations must be prepared to take actions before having the benefit of laboratory analyses. Sample collection, transport, and analysis require time, and the laboratory investigation results will not be known immediately. This limitation is particularly true for biological agents that may take several days to identify and quantify. Actions that may need to be taken without laboratory results are: (1) switching to an alternate water source, (2) isolating portions of the distribution system, (3) increasing disinfectant residual concentration, (4) shutdown of the entire water treatment facility, and (5) public notification.

## 4.2 BASIC CONTAMINATION INDICATORS

If water is contaminated, water quality parameters will likely change or deviate from “normal.” For that reason, water system data from daily operational logs should be compared against historical records. Operational parameters that should be checked during an investigation include raw and treated water disinfectant demand, pH, filter run times, conductivity, total organic carbon, total dissolved solids, and any reported customer complaints (e.g., tastes, odors, color, or low pressure). Water pressure measurements can also be informative because this data can help determine if a specific pipeline is experiencing overpressure (caused by the intentional feeding of contaminants) or under pressure (which could be the result of physical destruction or an attempt at intentional contamination). Customer complaints should also be scrutinized due to their unique nature of providing drinking water providers insight into water quality reaching consumer taps. Many chemical and biological contaminants can cause adverse health effects and change the aesthetic quality of the water when present.

## 4.3 CONTAMINANTS OF CONCERN

### 4.3.1 Overview

General information advocated by regulatory authorities regarding contaminant categories are provided below. The APHC has added several nuances and expanded upon some contaminant descriptions. Several water contaminant threat lists have been developed by the EPA and DOD, though this information was not provided for security reasons. If a water terrorism incident is suspected or confirmed, installations should work with approved laboratories, the APHC, regional Public Health Commands (PHC), and state and EPA agencies to respond. On a case-by-case basis, the APHC or PHC can provide installation’s contaminant threat information. This chapter can be included in the installation ERP in its entirety.

### 4.3.2 Biological Agents

Biological agents are microorganisms that cause disease in personnel, plants, animals, or cause the deterioration of material. Pathogenic organisms, such as certain bacteria and protozoa species, and viruses, are one type of agent while biological toxins are derived from organisms. Unlike chemical agents, biological agents can be used to target specific clinical results with varying degrees of severity. For example, certain biological toxins are fatal within minutes of ingestion, while some biological pathogens may produce lengthy and debilitating but nonfatal diseases. The following notes should be considered when a biological agent is suspected:

- A biological attack may be disguised as a natural outbreak, thereby inciting panic while reducing the likelihood that law enforcement officials will discover and apprehend the perpetrator.

- Incubation periods may mean that the onset of disease will not occur for hours to days after the attack. Late onset could complicate attempts to determine when and where the attack occurred.

- Biological agents are relatively easy to produce. Production requires only a basic level of knowledge and skill in microbiology along with several pieces of easily obtainable equipment. In some cases, the agent organisms may be isolated from nature while other required organisms may be purchased from laboratory suppliers.

- Many biological agents are stable in water for days and even months. Several agents are resistant to free chlorine disinfection. Chloramines are not effective at destroying these agents as exhibited by the significantly greater disinfectant contact time (CT) required for chloramines than free chlorine to inactivate *Giardia* and *Cryptosporidium* under typical water quality conditions.

### 4.3.3 Chemical Agents

There are a variety of weaponized chemical substances that are commonly referred to as chemical agents. These substances have varying degrees of toxicity and persistency. Chemical agents are not widely available or easy to obtain. Other toxic compounds such as pesticides, rodenticides, herbicides, and petroleum products are commercially available and easy to obtain. Terrorists are more likely to use these compounds to chemically attack a water supply.

## 4.4 SAMPLING AND ANALYSIS

### 4.4.1 The DPW/Operations Contractor and Public Health Program Role

During the contamination investigation, DPW/operations contractor and Public Health Program personnel would: (1) help emergency responders determine the location of drinking water sampling points, and (2) provide emergency responders with maps of the water system as well as specific water quality and operational information. An FBI or hazardous materials (HAZMAT) team would likely collect water samples and arrange for laboratory identification of the

contaminants. Components of an emergency water collection and test kit are described in Appendix C.

### 4.4.2 Specific Procedures

The ERP should provide general considerations for sampling and analysis. During an actual response, emergency action procedures, or those actions detailing how a response will unfold, should be developed and executed. Emergency action procedures should be created in cooperation with laboratories, law enforcement agencies, and public health agencies. Emergency action procedures will reduce misunderstanding and enhance communication between responding organizations.

### 4.4.3 Sampling Plan

Conduct sampling at multiple sites in the isolated area of known and suspected contamination. Additionally, collect samples around the perimeter of the isolated area to (1) establish background concentrations of the analytes and (2) confirm the extent of contamination. The ERP must contain a water distribution system map that identifies the following locations: child development centers, hospitals, troop medical clinics, garrison command headquarters, garrison command residences, and other on-post housing. Also, this map should indicate all water system assets (e.g., source, buildings, and storage tanks) and depict where the water system personnel regularly collect samples for bacteriological compliance monitoring.

### 4.4.4 Sampling Methodology

The laboratory selected to provide analytical support should provide the installation with instructions and methods for effective sample collection. Examples of the sampling requirements to be established by the laboratory are outlined below:

- Specify the appropriate sample containers including the container size, material (e.g., glass or plastic), and cleaning instructions.

- Determine whether samples should be chemically preserved. If so, the laboratory would determine the type of and concentration of preservative and would probably provide pre-washed sampling containers with the appropriate preservative added prior to sampling.

- Provide special instructions or procedures for sample collection (e.g., exclusion of headspace in the sample and appropriate procedures for preventing cross-contamination).

- Provide guidance to the installation in determining special safety requirements for sampling personnel.

### 4.4.5 Quantity of Samples

Coordinate the number and volume of samples collected with the selected laboratory. Samples must be of sufficient volume to allow the laboratory to perform necessary analytical procedures. In general, triplicate samples are required to determine the statistical variability in analytical results. If other local or federal agencies collect samples from the distribution system, the installation may want to consider collecting similar samples for independent analyses and verification.

### 4.4.6 Handling and Shipping of Samples

Proper handling and shipping are critical aspects of the sampling process. Consult with the analyzing laboratory to determine the appropriate procedures. Also, the installation should contact the HQ APHC at Aberdeen Proving Ground, Maryland for additional guidance on packaging and shipping of suspicious water samples. Generally, handling will consist of proper labeling [e.g., sample identification (ID) number, location, date, time, sampler's name, and special instructions], tracking with an approved chain-of-custody form, and storing samples as directed by the laboratory (typically 4 degrees Celsius (° C)). Samples must be packaged to prevent spill and leaks during shipping.

# CHAPTER 5
# AN EMERGENCY RESPONSE STRUCTURE TO ADDRESS WATER SUPPLY EMERGENCIES

## 5.1 INTRODUCTION

For years, Army installations have responded to and recovered from water supply emergencies caused by natural disasters (e.g., flooding, hurricanes, and tornadoes). More and more, Army installations can be expected to encounter other types of emergencies from man-made threats. Installation law enforcement and rescue operations are likely to be engaged. Therefore, readiness and training of these resources is warranted. This chapter will explain how the water system emergency response mission fits into the existing installation emergency operations structure and will introduce the reader to accepted emergency response concepts.

## 5.2 PHASES OF EMERGENCY RESPONSE

### 5.2.1 Crisis Management

Emergency response has two phases. The first phase is crisis management. Crisis management involves measures to identify, acquire, plan and use the resources needed to anticipate, prevent, and resolve a threat or act of terrorism. This emergency response phase is a law enforcement function and occurs when a threat is suspected or an act is initially investigated.

### 5.2.2 Consequence Management

Consequence management is the latter phase of emergency response and includes those measures taken to protect public health and safety, restore essential Government services, and provide emergency relief to governments, businesses, and individuals affected by the consequences of a terrorist attack. An example of consequence management includes medical management for illness resulting from exposure to a chemical intentionally injected into the potable water system. For domestic consequence management, the primary authority rests with the States to respond and the Federal Government to provide assistance, as required.

## 5.3 THE INCIDENT COMMAND SYSTEM (ICS)

### 5.3.1 Incident Response and Goals and Objectives

The ICS will be implemented during a response to a terrorist caused emergency. The ICS is part of the National Interagency Incident Management System, which was developed to provide a common system that emergency service agencies can use at local, state, and federal levels. The ICS consists of procedures for coordinating personnel, facilities, equipment, and communications. The primary objective of the ICS is the safe application and management of resources to effectively and efficiently manage any incident. During a water supply emergency, the anticipated stages of the response are: (1) investigation, evaluation, and site

characterization, (2) isolation and containment, (3) contaminant agent identification, and (4) decontamination and restoration of service.

### 5.3.2 ICS Structure

All incident responses will have an Incident Command unit. The Incident Command is comprised of an Incident Commander (IC) who may or may not have adequate resources under his/her control depending on the size of the incident. For medium- and large-scale incidents, installation and external resources are separated into four functional areas which are Operations, Planning, Logistics, and Finance. Each functional area is responsible for specific tasks of the incident as shown in Table 2 and is under the Incident Command. For small-scale incidents one person may be responsible for all of the duties listed in Table 2; although, for large-scale incidents, many people and local, state, and federal agencies may be acting under each functional group. For large-scale incidents, groups and/or divisions within each functional group may be formed which are responsible for specific tasks (e.g., traffic control, evacuation, bottled water distribution, water transport and production, isolation of the affected distribution system).

**Table 2. Responsibilities of the Command and Four Major ICS Functional Areas**

| ICS Organization | Responsibilities |
|---|---|
| Command | Overall management of the incident, incident safety, the interagency liaison, and public information; includes Safety Officer, Liaison Officer, and Public Information Officer; Incident Commander solely responsible, within the confines of authority, to establish objectives and overall management strategy |
| **Functional Area** | |
| Operations | Tactical activities which are directed toward the reduction of the immediate hazard; establishing situation control; restoration of normal operations |
| Planning | Collection, evaluation, dissemination of information about the incident, contingency planning |
| Logistics | Providing all support needs to the incident |
| Finance | Fiscal and risk management issues involved on an incident, including cost-tracking, time-tracking, procurement of contract services, and compensation and claims management. |

### 5.3.3 ICS Evolution during an Emergency

As the incident command requires more resources to save lives, protect public health, and infrastructure, the ICS structure becomes more complicated. As mentioned above, resources (support personnel) used to respond and recover from the incident fall under four distinct functional areas. Within each functional area, the resources can be further segregated into

groups. These groups can be assigned specific tasks (e.g., evacuation, water sampling and analysis plan development, triage, bottled water distribution, valve closing to isolate distribution system, door-to-door customer notification) which will help support the response.

### 5.3.4 Command Post, EOC, and Staging Area

As an incident unfolds, a command post (CP) is established near the incident site. The CP is the forward location where responders meet to discuss the situation. Typically, the senior fire official at the CP is the IC. This person is responsible for the incident response. If the incident cannot be handled by the responding resources alone, the emergency response command center called the Emergency Operations Center (EOC) is officially activated. Many Army installations have one EOC located on post. The EOC is usually equipped with high-tech electronics to include communications equipment and equipped for handling command and control large-scale emergencies. Representatives from the fire department, law enforcement, intelligence, DPW, Public Health Program, and logistics will converge on this location to manage the crises and consequences of a large event. The EOC is separate from the CP. During the response, the IC will be close to the action and will relay information back to the EOC periodically. The personnel located at the EOC will acquire adequate resources to support the incident responders in the field and make notifications as appropriate. The staging area is the location where supplies and equipment go before they are sent to the CP. This type of emergency operations structure can be compared to a battlefield where logistics and support equipment are sent to support the forward units when requested.

## 5.4 WATER SUPPLY PERSONNEL ICS PARTICIPATION

Depending upon the tactical objectives of the incident response, specific water system functional groups may be formed to complete specific tasks. These groups may be comprised of installation personnel, operating contractors, and/or external personnel, as the situation mandates. Some examples are described below. DPW and Public Health Program personnel could potentially be asked to fill or lead one or more of these groups depending on the scale of the response effort. Figure 1 shows an example of how an ICS would be developed to include water system personnel during an intentional contamination emergency.

### 5.4.1 Sampling Group

The Sampling and Analysis Group is responsible for coordinating the collection of water samples for laboratory analysis. Representatives of this group may not physically collect the samples, as HAZMAT crews, or personnel from the Weapons of Mass Destruction (WMD) Civil Support Team (CST), or FBI field office may execute this mission. Persons collecting water samples should have a minimum of protection against exposure (e.g., gloves). The Water Sampling and Analysis Group's primary responsibility is to develop the appropriate sampling and analysis plan. The group includes the DPW/operating contractor Drinking Water Coordinator, Medical Authority/Public Health Chief, Environmental Health Division Chief, and water system supervisor. At the discretion of the IC and law enforcement officials, this Group may work with the law enforcement community to secure and preserve evidence of biological, chemical, or radiological contamination.

### 5.4.2 Operations Group

This group is responsible for restoring all water treatment operations at the installation. The goal is to ensure that all processes are functional and that chemical addition occurs as designed. This group is often comprised of DPW and operating contractor personnel, but may be augmented by external personnel, as needed.

### 5.4.3 Pumping Group

This group is responsible for restoring pumping operations, if interrupted, and for coordinating pumping activities to achieve pressurization and minimize the propagation of contaminated water and, as possible, supplying safe drinking water to high-priority users such as hospitals and command centers.

### 5.4.4 Water Investigation/Valve Group

The water investigations and valve group will assist in the initial and ongoing incident assessment activities. This group will primarily develop a plan to isolate the affected infrastructure. The group will also coordinate with law enforcement as directed by the IC through the Operations Section. The water investigations/valve group will assist with implementation of the orders at the direction of the Operations Section by operating all system valves.

### 5.4.5 Repair/Disinfection Group

This group repairs infrastructure, such as water mains or hydrants that are damaged during an incident, and prepares these components to be reintroduced into service. Also, they ensure that all potentially contaminated mains or appurtenances are adequately disinfected.

### 5.4.6 Flushing Group

This group will implement unidirectional flushing or spot flushing to clear water mains of contamination.

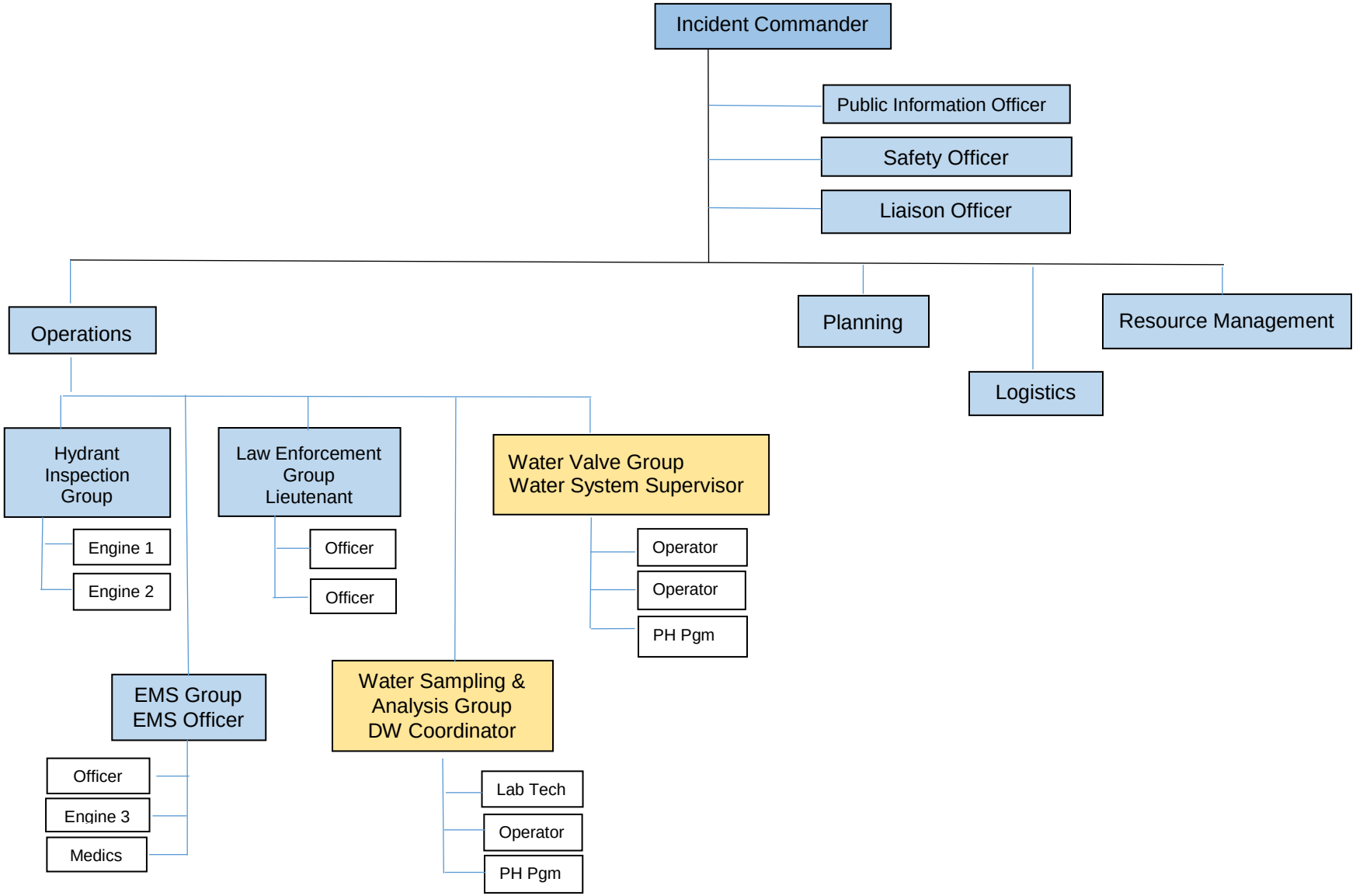


**Figure 1. Example Command Structure for Responding to an Intentional Drinking Water Contamination Incident**

## 5.5 EXAMPLE ICS FORMATION AND RESPONSE

### 5.5.1 Summary

The following example of an ICS response was developed to educate readers on how an incident may unfold. The example below explains the actions surrounding a threat of intentional contamination to an Army water system. All components of the response are not provided due to the brevity of this TG.

### 5.5.2 Discovery

At 0600 hours the water plant supervisor receives a telephone call from an unidentified person claiming to have contaminated a storage tank with a toxic contaminant. After collecting as much information as possible on the telephone, the water supervisor asks his system operators to inspect the storage tank with military police (MP) and alerts the DPW director/chief. Findings from the joint operator-police tank visit indicate the lock on the storage tank was cut, the tank hatch open, and a latex glove was found floating on the water surface. The responding patrol officer is designated as the IC and cordons off the area surrounding the storage tank to prevent access. At the direction of the IC, the water system operator that responds isolates the water tank by closing valves near the tank. The DPW chief is again notified.

### 5.5.3 EOC Activation

After initial notification by the water plant supervisor, the DPW chief contacts the Garrison Command Office by 0630. The DPW chief also alerts the MPs and Fire Department of the ongoing investigation. By order of the Garrison Commander at 0650 the EOC chief requests that the following EOC representatives report to the EOC location: Garrison Command Office, Public Affairs Office (PAO), Law Enforcement, Force Protection, Intelligence, Public Works, Preventive Medicine (PVNTMED), Logistics, Chaplain's Office, and Morale Welfare and Recreation (MWR). All EOC representatives arrive at the EOC at 0800.

### 5.5.4 Do Not Use Order

The EOC relies on information received from the CP and determines that affected customers must be notified not to use their water. The "Do Not Use" order is issued in conjunction with the PAO and prohibits using water for showering, laundry, drinking, or cooking purposes. In addition, this order describes where consumers can pick up bottled water provided by the installation.

### 5.5.5 External Resource Acquisition and Use

At 0930 and at the recommendation of the EOC, law enforcement requests assistance from the local WMD CST or FBI field office. The DPW Service Order Desk and Environmental Health Division report that they have received several customer complaints that describe negative health effects near the suspect storage tank. The Water Sampling and Analysis Group considers this information in their sampling plan which includes the storage tank and several buildings around post where sensitive populations are located (e.g., daycare centers, schools).

At 1000, the WMD CST and FBI teams arrive onsite. The CST collects and analyzes water samples from locations identified on the sampling plan and performs rapid presumptive testing of the water. Water samples are shipped to several DOD laboratories for confirmatory analyses. The State Drinking Water Agency and local EPA offices are notified by 1030.

### 5.5.6 Change-of-Command and Results

At 1100, representatives from the local FBI field office arrive at the EOC and request command of the incident because findings indicate that the water system has been attacked by terrorists. At this time, authority and command of the incident is transferred from the IC to the FBI. At 1130, the CST water presumptive testing results return positive for a toxic contaminant inside the storage tank and throughout the distribution system. At 1140, at the direction of the FBI, local hospitals are put on alert to recognize and report unusual admittances and exposure symptoms, and a “Do Not Use” order is prepared in coordination with representatives from the PAO, DPW, Medical Authority, and State Drinking Water Agency. The “Do Not Use” order requires that water in households and buildings should not be used for any purpose to include (but not limited to) toilets, bathing, firefighting, lawn watering, and recreational uses. To prepare for a long-term incident management, between 1140 and 1230 the installation logistics representative acquires temporary potable water production and distribution facilities from a reverse osmosis water purification unit (ROWPU) training team onsite. When the “Do Not Use” order is released the affected population is also told where and how they will receive replacement water.

### 5.5.7 The End of the Crisis Management Phase

Several days after the initial response to the incident, FBI, DOD, and Centers for Disease Control and Prevention (CDC) laboratory sampling results confirm the presence of a specific toxic contaminant in the water. Water samples taken from the storage tank, household taps, and also from several daycare centers and schools near the tank were positive. Further investigation reveals that local hospitals admitted several patients showing contaminant exposure symptoms. The EPA and FEMA would provide assistance during this recovery phase. In addition, infrastructure decontamination and efforts to return the water system to normal operations would also take place under the consequence management phase.

This page was intentionally left blank.

# CHAPTER 6
# GENERAL ROLES AND RESPONSIBILITIES FOR RESPONDING ORGANIZATIONS DURING EMERGENCIES

## 6.1 OVERVIEW

During an actual water system emergency, many organizations within the garrison command structure will support the well-coordinated response. Fire department and law enforcement organizations are the two most common responders. Because the emergency will involve the water system, the DPW/operating contractor and Public Health Program must be included in the response to provide technical support to law enforcement, emergency service, and special response teams (e.g., HAZMAT, CST).

## 6.2 DIRECTORATE OF PUBLIC WORKS

### 6.2.1 EOC

The EOC will serve as the installation focal point during an emergency. At the EOC, emergency responders and support staff will monitor conditions, direct responding emergency forces, and disseminate administrative/emergency notifications to installation activities and off-post organizations. On most Army installations, DPW will be responsible for daily EOC staffing in addition to their normal housing, utilities, and operation and maintenance duties. Some installations may give the EOC responsibility to the Directorate of Plans, Training, Mobilization, and Security (DPTMS). The new DPTMS focuses primarily on emergency planning and operations for the installation. On some Army installations, the EOC is also referred to as the installation operations center (IOC).

### 6.2.2 Environmental Regulatory Representation

The Environmental Office, either under DPW or reporting directly to the Commander, serves as the IC's representative with outside environmental regulators. This office provides guidance on environmental issues to ensure regulatory compliance and the provision of safe drinking water. To maintain compliance, the Environmental Office ensures that water system operations such as repair, flushing, disinfection, sampling, and system startup and shutdown are executed IAW state and federal laws. Some of these responsibilities may be delegated to the company that holds the privatization contract or government contractor. Privatized water systems or those that are government-owned, contractor-operated (GOCO) typically result in fewer roles and responsibilities for DPW. Nonetheless, DPW is still responsible for water system oversight, approving expenditures as needed, supervising all utility operations, directing facilities and/or operating contractor staff including WTP operations, repair of water mains, and coordinating equipment (e.g., excavators, dump trucks) and personnel (e.g., plumbers, electricians, and welders) to effect repairs outside the scope of WTP personnel. At some installations the operating contractor may have a larger role. However, DPW is still responsible for overseeing the contract activities to protect the health of the installation’s workforce and residents. The

DPW is also responsible for the disposition of waste generated and requirements for open air monitoring throughout the event.

### 6.2.3 After Action Review

The DPW should conduct an after action review (AAR) no more than 7 days after the exercise or incident. AARs allow participants to provide feedback for future training and identify challenges that need to be addressed. Following the AAR, the results of the AAR should be published and furnished to all participants. As future exercises are conducted the DPW should track response improvements. Chapter 9 describes AARs in detail.

## 6.3 PUBLIC HEALTH PROGRAM

The U.S. Army Installation Management Agency Public Health Program liaison helps DPW and/or operating contractors investigate and respond to an emergency. The Public Health Program should also support law enforcement, medical surveillance, and treatment. Specific responsibilities of the Public Health Program include: reporting the number of patients admitted to health clinics and hospitals; providing advice and guidance to commanders of other activities in the symptoms and treatment for persons exposed to chemical, biological, and radiological contaminated water; notifying the EOC of any fatalities and disposition of casualties released or transferred from the medical facilities; and coordinating with off-post medical facilities.

## 6.4 JOINT DPW/OPERATING CONTRACTOR AND PUBLIC HEALTH PROGRAM RESPONSIBILITIES

The DPW/operating contractor and Public Health Program are entirely responsible for the health of installation drinking water consumers with respect to the production of safe, clean drinking water. It is vital that these organizations have a good working relationship established before the emergency occurs. As standard practice, the DPW/operating contractor and the Public Health Program should notify one another and jointly investigate any suspected drinking water problems.

### 6.4.1 “Do Not Drink” Orders and Water Shutoff Notification Plan

“Do Not Drink” orders and a water shutoff notification plan are integral parts of responding to a water system emergency. Closing valves can allow the emergency responders to contain and isolate the suspected contaminated water, thereby reducing the number of persons exposed. The DPW/operating contractor and Public Health Program will jointly identify valves that need to be closed. Such isolation could result in parts of the system being cut-off from drinking water particularly in poorly looped systems. If consumers are going to lose access to drinking water, public notification must be coordinated with the PAO representative at the EOC. Shutdown and startup of the WTP can also prevent the spread of contamination.

### 6.4.2 Water Sampling Plan

During a water system emergency, the DPW/operating contractor and Public Health Program will develop the sampling plan to address the identified problem. This plan should attempt to

characterize the water throughout the entire distribution system and focus near the affected area. Sampling plans should be based on all available information that is known at the time of the response. Plans should at a minimum include water sampling near the incident site, as well as near or in buildings considered high-risk targets such as child development centers, command centers, and dining facilities. A minimum set of three samples at each site is recommended. Emergency responders (e.g., HAZMAT, FBI, CST) may actually execute the sampling plan depending on the suspected health risks. If emergency responders execute the sampling plan, the personnel must know proper collection, packaging, and transport procedures and wear adequate personal protective equipment (PPE) during the process. Recommendations on PPE are the responsibility of the Safety representative at the EOC. DPW/operating contractor and Public Health Program representatives must make certain that sample chain-of-custody forms are signed, dated, and accurate and sent along with the water samples.

### 6.4.3 Laboratories Chosen for Analyses

The DPW should coordinate with appropriate laboratories for emergency analysis of water including potential unknown contaminants. Laboratory capability should run the spectrum outlined in EPA Guidance. Likely, investigators will need to coordinate with multiple laboratories to achieve full capability of analysis. The following laboratories listed below should be considered. DOD laboratories are highly recommended.

- FBI recommended laboratories. The EOC Director will contact these laboratories through the FBI.
- The Army National Guard (ARNG) regional WMD CST. The EOC Director will contact these laboratories through the National Guard Commander.
- EPA recommended laboratories.
- APHC laboratory at Aberdeen Proving Ground, Maryland. The installation DPW Director or Public Health Program Chief will contact these laboratories through the Director, APHC or the APHC Staff Duty Officer.
- CDC recommended laboratories. The DPW Director or Public Health Program Chief will contact these laboratories through the CDC headquarters (HQ).

### 6.4.4 Water Emergency Restrictions

The Garrison Commander decides when to implement water emergency restrictions and conservation measures based on health risks posed by the suspect contaminated water and impact to the mission. Before the decision is made, DPW/operating contractor and Public Health Program personnel should estimate how much water is required and determine where the emergency water can be obtained. The installation logistics organization, Directorate of Logistics, usually has several vendors available to provide water during non-emergency conditions. The ERP should identify available water supply options for the emergency.

### 6.4.5 State and Federal Notification

Communication with state and federal regulatory agencies should be handled by one organization. At most Army installations, this is a responsibility of the Environmental Coordinator within the DPW. Using this one individual to coordinate with the regulatory authorities allows the installation to "speak" with "one voice," rather than receiving multiple, potentially conflicting messages. Public notifications such as the issuance of Boil Water Advisory, "Do Not Use" order, and news releases should, if possible, be coordinated with regulatory agencies. The issuance of public notices will have far-reaching effects on the health and psychological state of the local population. (Such notices would likely emanate from the installation PAO). A united installation-regulator response will demonstrate to the public that their health is the highest priority. Regulatory agencies should also help coordinate the cleanup of any contaminated material, decontamination of affected infrastructure, and disposal of contaminated solids, slurries, and liquids.

### 6.4.6 Water Quality Review

If contaminated drinking water is suspected, both the DPW/operating contractor and Public Health Program should scrutinize water quality. First, chemical and biological water quality data at the source, the WTP, and throughout the distribution system should be compared against typical data for those parameters (e.g., previous records). Specifically, chlorine demand, free-chlorine residual concentration, pH, conductivity, total organic carbon, turbidity, and bacteriological results should be examined for values outside of typical variability.

Second, water system operational monitoring and control indicators should be reviewed to include raw water quality, filter effluent turbidity readings, filter run times, distribution pressure readings, and storage tank water levels.

Third, any recent customer complaints to either the DPW/operating contractor or Public Health Program should be collected and analyzed. Since customers can detect tastes and odors of contaminants present at part per trillion levels, their feedback is very important. Analysis should include plotting complaint locations on a map and comparing them to one another and previous complaint records. The DPW/operating contractor and Public Health Program should evaluate customer complainant location, time and date reported, complaint description, any information concerning aesthetic qualities reported by the consumer such as water taste, odor, color, and clarity. Any DPW/operating contractor and Public Health Program field investigation test results for the complaint or sensory results should be reviewed too.

### 6.4.7 Population Surveillance

The DPW/operating contractor and Public Health Program should contact local medical clinics and hospitals to determine if any reported illnesses have been linked to drinking water. The following information from the patient's recent medical report is useful: patient's residence address, work location, exposure signs and symptoms, time reported/admitted, complaint description, and any information concerning aesthetic qualities reported by the patient such as water taste, odor, color, and clarity.

## 6.5 SAFETY

An installation Safety Office representative will likely be sent to the CP and/or EOC during a water system emergency. The safety representative should advise the IC regarding the safety and health of the response team members, workforce, and the general public. The safety representative is responsible for advising the emergency responders about the proper level of PPE required, safety procedures for collecting and shipping water samples, structural excavation, facility evacuation procedures, personnel accountability, and confined space safety.

## 6.6 FIRE AND EMERGENCY SERVICES

### 6.6.1 Important Organizations

Emergency service organizations such as the fire department and ambulances play a pivotal role in saving lives and minimizing property damage. Upon arrival at the incident site, the senior fire department officer will act as the IC and designate a CP. If the CP is already established by a law enforcement official onsite, the fire department officer will take charge and be designated the IC. The IC is responsible for determining whether or not HAZMAT or criminal activity are involved in the emergency. The CP is usually located near the incident site and will be the base of field operations. Other responsibilities of emergency service organizations include performing immediate personal decontamination, rescue, first aid, fire-fighting, and evacuation.

### 6.6.2 Fire-Fighting

If a fire is active upon incident discovery, the IC will decide how best to perform fire-fighting functions, based on an evaluation of all known factors including the type of hazard (chemical, biological, radiological). The IC will need to determine if water lines have been contaminated in the area affected. If this is the case, the senior firefighter should consider trucking in water to fight fires instead of using hydrants in that vicinity which may spread the contaminant and create more hazardous conditions.

## 6.7 LAW ENFORCEMENT AND INTELLIGENCE

### 6.7.1 Law Enforcement

Law enforcement plays a pivotal role in securing and safeguarding Army installations. During an emergency, the law enforcement representative at the EOC will direct their organizational resources to respond to the event. Law enforcement responsibilities could include setting up initial security perimeters at a suspected incident scene which may increase or decrease in size as new information becomes available. Other law enforcement responsibilities include:

- Barricading roads,
- Controlling traffic,
- Preventing entry of/exit of vehicular or pedestrian traffic,

- Securing military and personal property,
- Setting up defensive perimeters on one or multiple water system assets,
- Preventing tampering with fire hydrants,
- Reporting any equipment connected to fire hydrants, and
- Restricting access to or lock down any water system component.

Law enforcement usually provides police and security forces to investigate suspicious hydrant connections and potential tampering of water system property, enforce water emergency restrictions and water conservation measures, escort vehicles carrying suspect or confirmed contaminated water samples or contaminated materials to the receiving laboratory, and assist in evacuating and aiding nearby personnel to limit exposure to drinking water contaminants.

### 6.7.2 Intelligence

Depending on the installation, law enforcement may also have the role of rendering intelligence services to evaluate received threats on the water system using the local, regional, and DOD intelligence communities. Several military installations have a military intelligence unit external to the local law enforcement component.

## 6.8 OTHER INTERNAL INSTALLATION RESPONDERS

Other organizations on post can become involved in a large-scale water system emergency. These include the offices of logistics, chief counsel, staff judge advocate, chaplain, information management, public affairs, and resource management. Table 3 explains general responsibilities for these organizations. Representatives from these groups will be sent to the EOC. Table of Organization and Equipment (TO&E) units stationed on post may also be called to support the incident. Some TO&E units have generators and field water production, storage, and distribution equipment.

**Table 3. General Responsibilities for Other Internal Installation Responders**

| Organization Name | Responsibilities |
|---|---|
| Logistics | Provide equipment, property, food service support, transportation to response and recovery sites, and transportation for the evacuation of personnel; establish priority of maintenance support for vehicles and equipment that are used in the support of response and recovery forces. |
| Chief Counsel and Staff Judge Advocate | Provide legal advice and support to all affected commanders and staff and establish liaison and channels for coordination with military, federal, state, and local legal and law enforcement agencies. |
| Chaplain | Coordinate stress management and crisis event debriefings for responders and supporting personnel; provide advice and assistance on religious and morale matters; organize, mobilize, and employ Chaplain crisis response teams; and maintain liaison with local clergy associations to ensure religious and moral support for military and family community matters. |
| Information Management | Provide communications equipment, systems, and facilities such as trunked portable radio equipment to support sustained operations. |
| Public Affairs | Act as the installation spokesperson; release information to the public and respond to queries from news media, elected officials, and others; and conduct briefings to initial responders, emergency operations center personnel, and public affairs personnel. Also, review responses to the County Department of Health to reflect the Command Group's input. |
| Resource Management | Ensure that adequate funds are available in the garrison budget to support the performance of the water system emergency operations, provide for collection of extraordinary expenses (e.g., overtime, special equipment, etc.) for actual situations, and send requests for emergency funds and reimbursement through the major command or regional installation management office. |

## 6.9 STATE ARMY NATIONAL GUARD

The State ARNG could be called in to help respond to and recover from a water system emergency. This organization can also provide onsite WMD CST assistance. The mission of the WMD CST is to support civil authorities at a domestic CBRNE incident site with identification and assessment of hazards, advice to civil authorities, and facilitating the arrival of follow-on military forces during emergencies and incidents. Each team is composed of 22 highly trained, full-time members of the Army and Air National Guard. The teams are federally resourced, trained, and evaluated but operate in Title 32 status under the command and control of the State Governor. This organization is, therefore, a state asset and must be requested by the EOC through the respective Governor's office. The ARNG could provide air transport support within existing capabilities as requested through the state. Analytical support is provided by an Analytical Laboratory Suite (ALS) which provides a science-based analysis capability for CBRNE samples to identify threats from a potentially contaminated environment.

## 6.10 APHC AND PUBLIC HEALTH COMMANDS

The APHC or regional PHCs can provide onsite or remote assistance. Specifically, the APHC or the PHC can evaluate water system threats, analyze for unknown contaminants, help develop or provide public information, assist in the selection of decontamination strategies, and determine health/environmental criteria for water system emergency activities. The APHC or the PHC can also provide post-incident, low-level, environmental monitoring, data interpretation, and risk assessment. The APHC or PHC cannot provide first response monitoring. All requests for emergency assistance must be directed to the headquarters office located in Aberdeen Proving Ground, Maryland or to the respective PHC Command.

This page is intentionally left blank.

# CHAPTER 7
# ERP PROJECT ADMINISTRATION

## 7.1 AUTHORITY

### 7.1.1 Host Installation

The ERP developers, even if they are internal, must acquire authority from the host installation. This authority provides justification for requesting information from installation personnel, contractors, outside companies and agencies, as well as access to facilities. The “customer” for the ERP is the garrison commander, and the persons that make up the ERP development team should ensure contact and coordination with this individual or his/her designee. Typically, the DPW or operating contractor is the primary contact for the water system ERP though some installations are choosing to designate the DPTMS and/or the EOC Chief as the project contact person. In many cases when the water system is involved, the DPW will likely be the installation lead contact, working with the operating contractor(s).

### 7.1.2 Notification

A formal notification letter should be sent to the installation at least 2 weeks before the onsite visit to ensure all necessary installation personnel can accommodate the assessment team. The notification letter should include the dates of the assessment, address security and facility access issues, and describe the assistance required. The letter must also stress installation involvement throughout the entire process. Full participation in ERP development, training, and subsequent tabletop and field exercises will be critical in the ability of an installation to respond and recover from a water system emergency and will be the difference between an ERP that collects dust on the shelf and a useful document.

## 7.2 PLAN DEVELOPMENT TEAM

At least two plan developers should execute this plan. One of these personnel should have prior emergency response planning experience. More team members may be desirable given the complexity of a system and/or time constraints. At least one team member must have a secret or greater security clearance in order to review the water system vulnerability assessment that was conducted to comply with the *Public Health Security Bioterrorism Preparedness and Response Act* (reference 1) and the AWIA (reference 4). It is desirable for one plan developer to have conducted or participated in the installation’s water system vulnerability assessment since many of the same installation personnel will be contacted during ERP development.

## 7.3 PRE-VISIT ACTIONS

### 7.3.1 Regulatory Format Requirements

ERPs developed for installation water systems must meet not only federal and Army requirements but also state and local requirements. The plan developers must contact the state drinking water primacy agency as well as state and county emergency management agencies to

determine whether or not water system ERPs must meet specific guidelines. Several states, including California and Maryland, required water supply emergency plans prior to the passing of the Bioterrorism Act (references 20 and 21).

### 7.3.2 Document Review

Team members should gather as much information about the water system and installation emergency response assets before the onsite visit. The documents listed below should provide a general structure for existing emergency response activities as well as information on water system assets. It may prove beneficial to review the ERP template and instructions developed by the EPA subsequent to the enactment of the AWIA (reference 24).This ERP template may assist in document development and the certification of a viable plan. Additional information includes, but is not limited to, the following plans and resources:

- Existing installation emergency response plan resources:
    - Biological, chemical, and nuclear accident and incident response and assistance (BAIRA, CAIRA, and NAIRA) plan.
    - Radiological accident plan.
    - CBRNE plan.
    - Unexploded ordnance plan.
    - Environmental disaster plan.
    - Air release plan.
    - Spill Prevention, Control, and Countermeasure Plan as required by AR 200-1.
    - Installation Spill Contingency Plan as required by AR 200-1 (reference 22).
- Existing water system emergency response plan resources:
    - Water Resource Management Plan as required by AR 420-1.
    - Water system emergency supply, contingency, and response plans as required by AR 420-1.
    - Past water system incident reports and actions on file with the EOC.
- Water system operation and maintenance materials:
    - Potable water system flushing plan.
    - Water conservation plan as required by AR 420-1.

- Public Notification Plan as required by AR 420-1.
- Standing Operation Procedure (SOP) for alerting personnel in emergencies that clearly defines the duty of key individuals during the emergency as required by AR 420-1.
- Wellhead Protection Plan as required by AR 200-1.

- Other documents that provide useful information:
  - Classified water system vulnerability assessment.
  - Most recent map of the entire water system showing all raw water sources, raw water transmission lines, WTPs, storage tanks, finished water piping, hydrants, major water suppliers, isolation valves, major buildings, critical customers, and neighboring interconnections in electronic and paper forms *(if this map is not present in the plan, developer must create this map for the ERP).*
  - Water treatment facilities maps in electronic and paper forms.
  - Personnel alert lists and logs.
  - Copies of any Memorandums of Understanding (MOU) or Memorandums of Agreement (MOA) between private companies, municipalities, counties, or other government organizations to provide any type of support (water supply, emergency response, or medical) to the installation during an emergency. These include bottled water companies, other water systems connected to the installation water system, local or regional fire departments, and hospitals.
  - Water distribution system maps showing major water mains, storage reservoir locations and capacities, as well as the building number and location of any child development centers, schools, hospitals, garrison headquarters, or other high-visibility or immunocompromised populations.
  - Electronic copy of any Geographical Imaging System (GIS) or AutoCAD data used to develop maps. This information should include files designating drinking water and wastewater pipes, roads, buildings, hydrants, and the installation boundaries.

## 7.4 ENTRANCE MEETING AND ONSITE ACTIONS

### 7.4.1 Equipment and Supplies

The following items are recommended during an onsite ERP visit: laptop computer (with cables) and a cellular telephone to setup and double check appointments. Access to restricted sites (e.g., inside the EOC) should be coordinated by the ERP project team before the onsite visit.

### 7.4.2 Entrance Meeting

Prior to onsite arrival, the team leader and installation point-of-contact should coordinate the entrance meeting time, date, and location. This information should also be provided in the notification letter. Representatives from all organizations that could be involved in a water system emergency should attend the entrance meeting including assets within the installation boundaries, but also those within local municipalities, cities, and towns. The plan developers should meet and schedule interviews during the entrance meeting. If available, one plan developer should take detailed notes while the other presents the project and answers questions.

### 7.4.3 Entrance Meeting Outline

During the entrance meeting the team leader should follow the proposed outline shown below:

- Introduction. Introduce the water system ERP team and thank representatives for attending.

- Regulatory Requirements. Briefly mention the ERP requirement of the *Public Health Security Bioterrorism Preparedness and Response Act*, as well as AWIA, state, and Army requirements.

- Potential Attack Scenarios. Mention possible threat scenarios posed to the water system and resulting effect. None of this discussion should particularly reveal water system vulnerabilities identified in the classified vulnerability report.

- Organizational Support. Discuss the potential number of organizations involved in an installation water system emergency.

- Project Timeline. Talk about the project timeline (if included in the scope of work, propose when a tabletop meeting will be held to exercise the plan) and provide contact information. Answer questions and schedule interviews.

### 7.4.4 Handouts

Plan developers should provide the attendees' printouts of the PowerPoint® slide presentation. In addition, a meeting sign-in sheet that lists the attendees' name, organization, telephone number, and email should be circulated around the room and collected. This sign-in sheet will be useful when setting up meetings and asking for information after the entrance meeting.

### 7.4.5 Onsite Actions

#### 7.4.5.1 Contact Information

Discussions with representatives from the DPW/operating contractor and emergency response organizations prior to the onsite visit will be invaluable. Interviews should identify points-of-contact within the organizations as well as the responsibilities and response equipment available during a water system emergency. All contact information (telephone numbers, email addresses, fax numbers, names, organization, and city or town location as a guide) should be verified during the interview. Questions outlined in the questionnaire in Appendix D can be used. It is common that during the interviews the ERP developers will realize that other persons not previously thought of should be contacted.

#### 7.4.5.2 Organizations to be Involved

Plan developers should contact emergency response organizations on post (government, municipal, or contractor) that would respond to a water system emergency. Some of the organizations that should be contacted were provided in Chapter 3. Discussions with these organizations may direct the ERP team to contact other important organizations.

#### 7.4.5.3 Off-post Support

Depending on the type of emergency, off-post organizations may be called in to provide support. Table 4 lists some organizations that may become involved. The team should get permission from installation staff to coordinate with any off-post entity. Neighboring organizations located outside the installation may be useful in an emergency support situation and should be contacted by the plan developer or an installation representative to determine their ability to assist during a water system emergency.

**Table 4. Off-post Local, State, and Regional Organizations to Contact**

| Organization Type | Name |
|---|---|
| *Emergency Responder* | FBI Field Office / WMD Team<br>Regional WMD Civil Support Team<br>Local Police Department<br>Local Fire Department<br>Local Public Works Department<br>Local and Regional Hospitals<br>Health Departments<br>Local and Regional Laboratories<br>State Drinking Water Program |
| *Emergency Management* | Local / County EOC<br>Local / County / State EMA Office<br>FEMA Office |
| *Recovery* | Local Red Cross Office<br>Local and Regional Military Water Production Teams Bottled / Packaged Water Co.<br>Sanitation Vendors (e.g., Portable Chemical Toilets)<br>Heavy Construction Contractors<br>Ice and Refrigeration Vendors |
| *Equipment and Supply* | Pumps, Pipes, Parts Suppliers<br>Plumbers<br>Chemical Suppliers<br>Local Street, Road, and Highway Department<br>Local Water Treatment Plants<br>Local Wastewater / Storm Water Utility |

Legend:
FBI = Federal Bureau of Investigation
WMD = weapons of mass destruction
EOC = emergency operations center
FEMA = Federal Emergency Management Agency

#### 7.4.5.4 Formal Support Agreements

Plan developers should search for any existing MOAs or MOUs to determine if a support plan exists between the installation and external organization to provide support during an emergency. Typically, plan developers have found that there are many verbal agreements to come to the aid of the installation during an emergency but no formal ones. This information needs to be determined by the plan developers. If no agreements are in place, ERP report developers should recommend in the project summary report that they be formalized.

#### 7.4.5.5 Neighboring Water Systems

The plan developers must determine if neighboring water system connections exist. For instance, many Army water systems have been connected to a neighboring water system at one time with a mutual aid agreement. Over time, however, these connections have been severed (due to new construction). In many cases, the connections were never reinstated

unbeknownst to the public works. This type of information needs to be determined during the water ERP project and should not be left up to the first responder during a full-scale emergency. Also, the potential to create a new interconnection should be examined.

#### 7.4.5.6 LEPC

As outlined in the *Public Health Security and Bioterrorism Preparedness and Response Act,* "community water systems shall, to the extent possible, coordinate with existing Local Emergency Planning Committees when preparing or revising an emergency response plan." Plan developers should contact the installation emergency services and determine whether or not the LEPC is involved in the emergency planning process. LEPCs should be contacted by the team if drinking water is produced on post and sold to a community outside the installation boundaries. A listing of more than 3,000 LEPCs as of October 2003 can be found at http://www.epa.gov/epcra/state-emergency-response-commissions-contacts .

#### 7.4.5.7 Vulnerability Assessment

Team members must review the water system vulnerability assessment to identify the highest risk scenarios. Response actions will need to be included in the ERP to address these scenarios. Without revealing vulnerabilities, the plan developer should outline, with the help of the installation representatives, what actions need to be taken to respond to and recover from the event (e.g., failure of raw water line, loss of electrical power, failure of storage tank). The most important factor of integrating the vulnerability assessment is not the vulnerability itself, but how to respond if the vulnerability is exploited. The incorporation of the vulnerability assessment findings into the ERP can be accomplished by considering the following scenarios: physical destruction or loss of an asset, intentional contamination of the water system, and a cyber attack against the water system. An acceptable action to any of these scenarios can be broken into three main tasks: (1) response (crisis management), (2) recovery (consequence management), and (3) remediation (consequence management). The installation military intelligence (MI) or Force Protection office is likely to know the location of the water system vulnerability assessment.

#### 7.4.5.8 Information Verification

All emergency response organizations' contact information (telephone numbers, email addresses, fax numbers, names) should be verified by the plan developers. Many installation personnel who will or have been involved in a water system emergency use personnel alert lists. The ERP team should obtain copies of these lists and incorporate accurate and up to date lists into the water system ERP.

### 7.5 MATERIALS ACQUIRED AND PROJECT NOTES

Materials used to develop the ERP should be handled using "Controlled Unclassified Information" (CUI) classification guidance unless specific guidance is provided by the installation. Any files, documents, or information acquired should be guarded as it may contain personal contact information (e.g., home addresses, telephone and pager numbers).

## 7.6 ERP DEVELOPMENT AND REVIEW

### 7.6.1 Classification

The ERP should include all items explained in Chapter 8 and be labeled “CUI.” Working ERP drafts should also be handled “CUI.” The ERP should not become a secret document because it will be unavailable to frontline emergency responders. If the ERP is classified as a secret document, the plan developers should remove information that causes document classification.

### 7.6.2 Review and Exercise

At a minimum, once the plan is drafted, all major response organizations should review the plan to verify or correct their roles and contact information. Ideally, an exercise could be conducted to help determine the usefulness of the ERP. Exercises are not required to comply with the federal law but are highly recommended by APHC and the EPA. Chapter 9 describes these exercises.

## 7.7 FINAL PROJECT MEETING

If requested by the installation, a final project meeting can be coordinated and scheduled. Any organizations or persons that wish to attend the final project meeting, who did not attend the entrance meeting, should be directed to contact the ERP installation point-of-contact. During the final project meeting the team leader can follow the event sequence shown below.

- Introduction. Introduce the water system ERP team, thank representatives for attending, and discuss the entrance meeting.
- Regulatory Requirements. Briefly mention the ERP federal, state, county, and Army requirements.
- ERP Outline. Give an overview of the ERP outline (provide clearly labeled final copies to the attendees).
- Provide Scenario/Review Exercise. Provide a brief scenario and ask the attendees to determine a response sequence using the information in the developed ERP. Review lessons learned from conducting the exercise.
- Question and Answer. Answer questions that anyone might have.

## 7.8 PROJECT DELIVERABLES AND TRANSMITTAL

The final ERP document should be provided to the installation point-of-contact in electronic form via compact disk and in paper form. In addition, a transmittal memorandum should accompany the ERP along with a short 5–10 page report. This short report should contain a brief summary of important information and identify future actions the installation should take to better prepare them for responding to a water system emergency.

This page is intentionally left blank.

# CHAPTER 8
# CRITICAL COMPONENTS OF AN EMERGENCY RESPONSE PLAN

## 8.1 INTRODUCTION

This guidance is based on proposed ERP outlines distributed by the Association of State Drinking Water Administrators (ASDWA), the EPA, and National Rural Water Association as well as some state drinking water and emergency management agencies. Existing ERPs for several municipal water systems were also used in the development of this guide. While this TG is helpful, plan developers must still contact the state drinking water primacy agency and determine if the state requires certain agencies to be contacted under emergency conditions. Further, the EPA has provided an ERP template in consonance with the AWIA standards which may prove helpful (reference 24).

## 8.2 REGULATORY REQUIREMENTS

An ERP includes a brief discussion about the regulatory requirements and policy. The following regulations apply to Army water systems: Safe Drinking Water Act (SDWA) as amended by United States USPL 107-188, USPL 115-270, state and county codes (if applicable), and AR 420-1 (references 1, 4, and 5).

## 8.3 POLICY

### 8.3.1 Mission

The ERP's policy section defines the mission of the water system and describes general emergency response guidelines. During an emergency response, the main mission is to continue minimum service levels, mitigate the public health risks from drinking water contamination, provide reliable water service, and minimize public health risks from unsafe drinking water. Drinking water systems must not only provide potable water for drinking and sanitation purposes, but they also support fire-fighting operations and industrial activities.

### 8.3.2 Types of Emergencies

The ERP defines what types of emergencies and/or disasters are likely to affect water system operation. Specific disasters that the water system may experience are described in Chapter 2 and should be listed in this section. This information will help responders understand how the water system may be affected.

### 8.3.3 Additional Response Resources

The ERP includes an inventory of system resources available for emergencies. This inventory includes maps and schematic diagrams of the water system, and lists of emergency equipment, equipment suppliers, and emergency contract agreement(s). Plan developers can gather much

of this information from various individuals and organizations (DPW/operating contractor, logistics, operations and maintenance, and Public Health Program).

### 8.3.4 Coordination

Coordination procedures with Government agencies for health and safety protection; technical, legal and financial assistance, and public notification should also be explained in the water system ERP. Typically, this information is described under the notification and reporting section.

### 8.3.5 Response Actions and Reporting

The ERP describes basic response guidelines. For example, personnel will, as quickly as possible, determine the status of other employees, assess damage to water system facilities, provide logistics for emergency repairs, monitor progress of repairs and restoration efforts, communicate with health officials and water users according to this plan, and document damage and repairs. The plan also describes steps that will be taken to resume normal operations and to prepare and submit reports to appropriate agencies. Response guidelines for identifying the nature of the emergency are very important and must be explained along with procedures for reporting potential water system emergencies.

## 8.4 CONCEPT OF OPERATIONS AND NOTIFICATIONS

Information must be provided to the installation on what constitutes formal initiation of the ERP and who is responsible for this act. Specific actions for responding to threats and investigating possible incidents are necessary in an ERP. The following guidelines can be used in the water ERP.

### 8.4.1 Notifications

When there is indication of a threat to the water system (natural or manmade), plans will be reviewed and coordination effected to ensure orderly execution. Upon coordination with the Command Group, the EOC initiates notification schemes to ensure distribution of the information relative to the potential threat.

### 8.4.2 Response to Water System Emergencies

Notification of an emergency is key to isolate or minimize a potential hazard/threat. During an emergency, the DPW/operating contractor will notify law enforcement, the IOC, and the Public Health Program about potential health and operational impacts of the ongoing emergency and response. If an emergency cannot be handled by installation resources, the DPW/operating contractor will request response support through the EOC. Any emergency should be investigated. Suspected or confirmed water system threats or attacks can have secondary consequences (including the use of secondary explosive devices). A unified approach to investigating these threat warnings should be taken. The decision logic illustrated in Figure 2 should be used when investigating a threat warning.

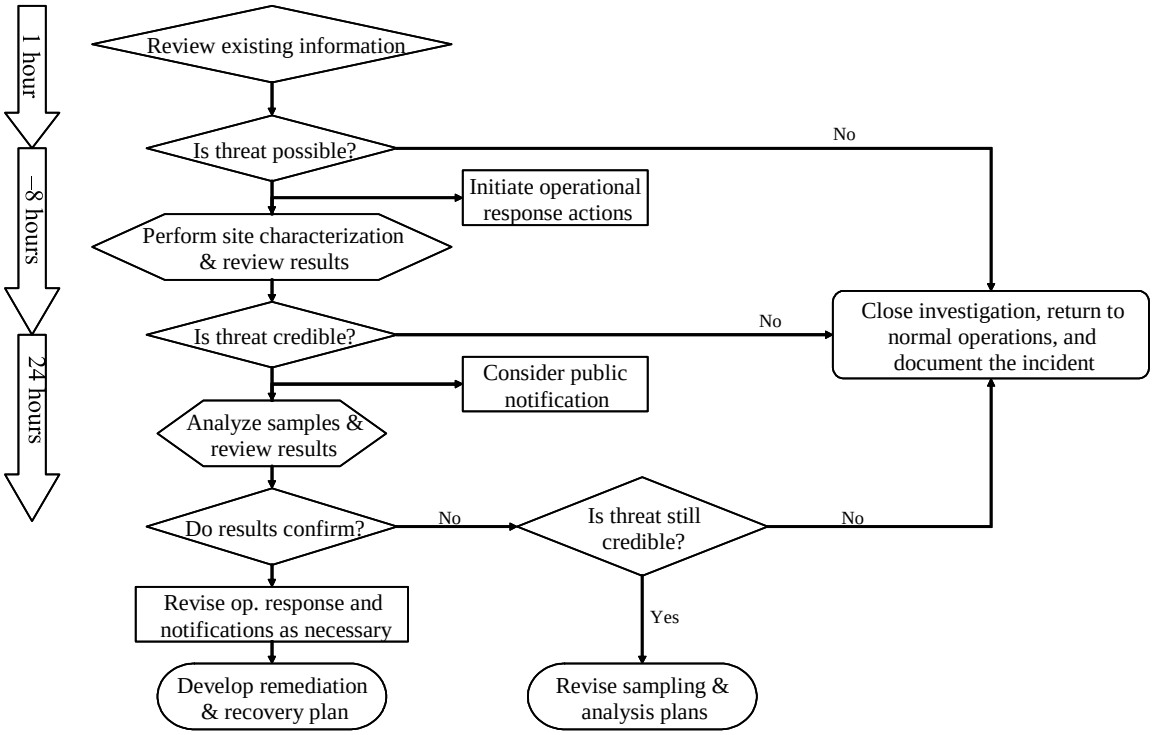


**Figure 2. Decision Logic for Investigating Threat Warnings**

#### 8.4.2.1 Possible Threat

Within 1 hour of discovering a threat warning, the DPW/operating contractor, law enforcement, EOC, and Public Health Program should meet to discuss the potential problem and determine whether or not the threat is possible. A threat is characterized as possible if the circumstances of the threat warning appear to have provided an opportunity for contamination. If determined to be possible, the DPW/operating contractor should notify, if they have not done so already, local law enforcement, the state drinking water agency, and alert staff and personnel about the threat warning.

#### 8.4.2.2 Credible Threat

Within 8 hours of receiving the threat warning, the DPW/operating contractor, law enforcement, EOC, and Public Health Program should determine if the threat is credible. A threat is credible if information collected during the threat evaluation process corroborates with information from the threat warning. If determined to be credible, the DPW/operating contractor should consider isolating wells and portions of the water system by closing valves, shutdown the system and provide alternate water, and conduct testing recommended by monitoring and sampling experts.

#### 8.4.2.3 Confirmation of Incident

Within 24 hours of receiving the threat warning, the DPW/operating contractor, law enforcement, EOC, and Public Health Program should determine if the incident has been confirmed. Incidents are confirmed if the information collected over the course of the threat evaluation provides definitive evidence that the water system has been attacked and/or contaminated. If confirmed, the EOC should execute formal notifications and request support as necessary.

## 8.5 RESPONSIBILITIES

Responsibilities of garrison organizations should be outlined in the ERP similar to those described in Chapter 6. Responsibilities of tenant organizations on post as well as those external to the installation that can also provide emergency support equipment and technical assistance should be listed too. At a minimum, contact information for external support organizations should be included in the ERP.

## 8.6 REPORTING REQUIREMENTS

### 8.6.1 General

The best defense against terrorism is to be alert and watchful for suspicious acts and personnel, particularly those carrying suitcases or other containers. Unidentified and/or abandoned vehicles, suitcases, and parcels near water facilities should be reported to DPW/operating contractor and MPs. Suspicious fire hydrant connections and running water originating from buildings should also be reported to DPW/operating contractor and MPs. Unusual signs or symptoms of illness should be reported to the local medical authority (e.g., Public Health Program). If the IC in coordination with DPW/operating contractor and Public Health Program determine that the water system could be contaminated, response actions will be taken to further investigate the source, isolate the affected distribution system, cleanup, store, and dispose of the affected materials as well as the return of the water system to service.

### 8.6.2 Water Emergency Determination

The garrison commander, or designee, has the authority to declare a water system emergency. The DPW/operating contractor is responsible for recommending the declaration of a water system emergency to the garrison commander. The DPW should determine if support from the EOC, law enforcement, and Public Health Program is required for the response. A confirmed water system contamination event is considered an emergency.

### 8.6.3 Incident Reporting

Upon the declaration of a water system emergency, the EOC should promptly notify the required organizations. The DPW is primarily responsible to make certain that the organizations on post which are needed for the water system response are notified. A copy of all written reports submitted to federal, state, or local regulators should be forwarded through the Chief, PAO representative at the EOC for approval. Notification of the following organizations should be considered if a water system emergency is declared: local health department, State drinking

water agency office, regional EPA office, U.S. Army Installation Management Command (IMCOM) Regional Office, National Response Center, and U.S. Army Major Command HQ Office (e.g., U.S. Army Forces Command and Army Materiel Command). If the water system has been attacked, all of the aforementioned organizations should be notified.

## 8.7 INSTALLATION AND WATER SYSTEM OVERVIEW

### 8.7.1 General Information

This section should include information specific to the water system, including the public water system (PWS) ID number, system owner and contact information (name, title, organization, branch, work commercial telephone number, DSN, home telephone number). Prewritten directions will be invaluable during emergency responses that involve agencies external to the installation.

### 8.7.2 Populations and Customers Served

Briefly identify the customers served by the water system. Areas serving military and dependent populations should be identified, as well as commercial/office areas within the system. Industrial operations should also be identified. The names and locations (building numbers) of critical customers such as child development centers, dental clinics, hospitals, dependent towns, cities, and connected communities should be provided in this section, as well.

### 8.7.3 Maps

Maps of the water system are particularly useful during emergency operations. Current water system maps should show all water lines (raw and potable), fire hydrants, control valves, and interconnections with other water systems connections as well as major treatment, pumping, and storage buildings. Roads and buildings are also helpful to responders as they can be used as a guide. The locations of surface water bodies (e.g., lakes and rivers) and other natural features are also helpful, especially if a “Do Not Use” order is issued and water in the lines cannot be used for fire-fighting purposes. If maps are not present at the time the ERP project is conducted they should be developed by the plan development team.

### 8.7.4 Basic Information

Basic information regarding the water system facilities and operations should be provided, along with a copy of the most recent Water System Vulnerability Assessment (WSVA). Included in this section should be a delineation of emergency generators and pumps available for use, along with their locations.

### 8.7.5 Chemical Treatment Information

Information on each chemical that is used and stored in water plant facilities should be accessible to emergency responders in the ERP. Specific data that should be included: chemical name, storage location, purity, quantity, vendor name, and vendor contact information. Material Safety Data Sheets (MSDSs) should be included in the appendix section of the ERP.

These data sheets will be a critical resource to emergency responders during water system contamination or a chemical feed/building physical destruction incident. If MSDSs are not available onsite, the chemical supplier and/or manufacturer should provide them.

### 8.7.6 Priority-of-Service List

Water demand on an installation will tend to increase at the onset of a disaster or emergency. Reasons for this include fire-fighting efforts, ruptured water mains, and water collection for storage. The priority-of-service list should prioritize organizations, units, and/or buildings that require water service during an emergency. A priority-of-service list should be drafted by the plan development team and provided to the installation Command for review. The following points should be considered when developing a priority-of-service list: (1) potable water for survival, (2) mission essential water requirements, (3) critical facility water requirements, (4) special unit water requirements, (5) housing/barracks requirements, and (6) general installation water requirements. The existing Mission Essential Vulnerable Assets (MEVA) listing of critical assets that must receive water at all times should be incorporated into this documentation.

## 8.8 ALTERNATIVE POTABLE AND NONPOTABLE WATER AND ICE SOURCES, REFRIGERATION AND SANITATION FACILITIES

### 8.8.1 General

Depending on the extent of the emergency, safe drinking water and the facilities it supports may not be available. The denial of water affects not only drinking and washing but also waste disposal and fire-fighting. The ERP should consider responses for these uses during emergencies. Installation DPW and logistics offices should have information concerning the acquisition of emergency supplies.

### 8.8.2 Drinking Water Required

The installation water supply should be considered at a critical level when the quantity of stored water is equal to or less than the firefighting demand and there is no additional water production available. If installations were to reach critical water levels, water restrictions should be implemented. Restrictions should only be maintained for as long as is absolutely necessary to allow the distribution system to come back online. A short brief table should be included in the water system ERP which identifies the amount of water required (in gallons) at normal operating capacity for the service population over 1, 5, and 7 days. This table should provide installation personnel quick answers to questions involving how the population is affected by an emergency event. In addition, the estimated volume of water required should include unaccounted for workforce personnel and units training on facility grounds. Estimated water required should include drinking water, water for sanitation and washing, and water used in food preparation. The Army Corps of Engineers (COE) estimates that 5.0 liters will be used per person per day under emergency situations for drinking purposes. Water conservation plans should be consulted as they sometimes estimate installation water usage requirements.

### 8.8.3 Drinking Water Alternatives

#### 8.8.3.1 Neighboring Water Systems

Water systems located in communities surrounding the installation should likely be the first alternate source considered by the installation. Many installations have informal verbal agreements with public or private water suppliers located adjacent to post, while others have established MOUs or MOAs with neighboring water systems. Formal agreements such as MOUs and MOAs should identify how much water can be provided to the installation under emergency conditions. This information should be obtained by the plan developers and described in the ERP. Water from neighboring systems can be provided via interconnections or pumped directly into water transport vehicles. During a regional water shortage event or if demand of the installation is greater than available production of local treatment plants, local water systems may not be able to compensate for the installation demand. In that case, other sources should be considered. The DPW/operating contractor must periodically verify that the interconnections are operable.

#### 8.8.3.2 Installation Assets

The Army/Air Force Exchange Service (AAFES) on the installation often maintains additional pallets of bottled water that can serve as an interim source of potable water for personnel and activities. AAFES must be incorporated in the ERP as an interim source of water. In addition, a description of available U.S. military water production units should be included in this discussion. This description should identify the type and quantities of field water production and storage equipment on the installation as well as the owner of the equipment. A brief description of emergency drinking water production and storage assets used by the military are listed in Tables 5 and 6. Figure 3 provides a process flow schematic for the Army's ROWPU.

#### 8.8.3.3 External Army Resources

In addition to local installation resources, typically the State National Guard units have field water supply equipment available in the event of an emergency. The COE should also have these resources available and are the lead for DPWs/operating contractors during national emergencies as classified in the Federal Response Plan (FRP) (reference 23).

**Table 5. Military Water Production Equipment Overview**

| Asset Name | Descriptive Information |
|---|---|
| Reverse osmosis purification unit (ROWPU) | Multistage water treatment unit capable of treating all qualities of water (Figure 3). Available as 600 gph, 1,500 gph, and 3,000 gph. Cannot be directly connected to wells. Can draw from undamaged storage tanks. Equipped with granular activated carbon (GAC) and ion exchange units for treatment of nuclear, biologically, and chemically (NBC) contaminated water. |
| 1,500-gph Tactical Water Purification System (TWPS) | Fully contained mobile water purification system; incorporates multimedia and cartridge filtration prior to RO treatment; equipped with GAC and ion exchange units for treatment of NBC contaminated water. |
| 125-gph Lightweight Water Purifier (LWP) | Highly mobile and purifies from both fresh and saltwater sources; weighs less than 2,000 pounds, for transport by High Mobility Multipurpose Wheeled Vehicle (HMMWV) and also UH-60 helicopter. |

Legend:
gph = gallons per hour

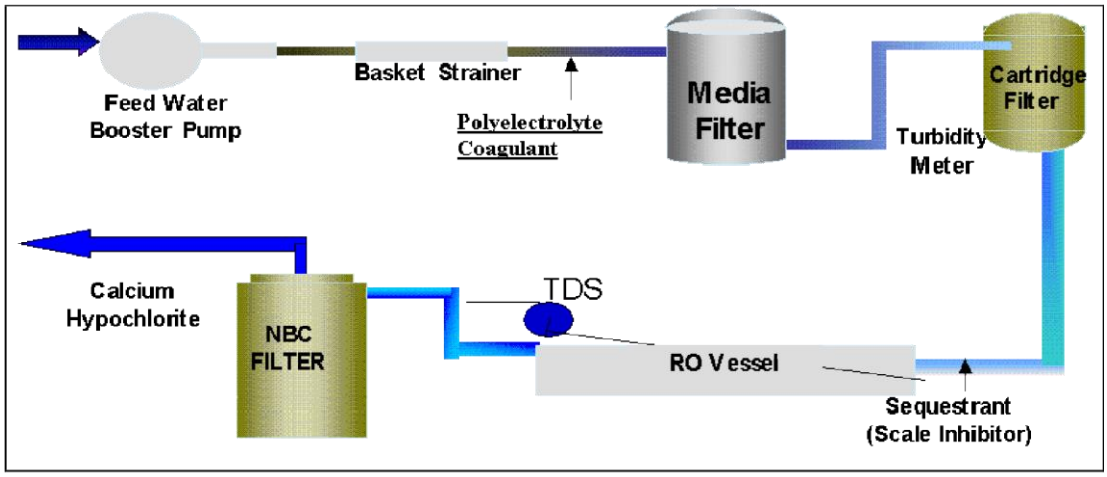


**Figure 3. ROWPU Process Flow Schematic**

**Table 6. Military Water Storage and Distribution Equipment Overview**

| Asset Name | Descriptive Information |
|---|---|
| Semi-Trailer Mounted Fabric Tank (SMFT) | Transports drinking water; a collapsible tank with pressure gage, end-fittings, tie down straps, emergency repair items, hose, and tools to secure the tank safely to the trailer; can only be transported full or empty; 3,000- and 5,000-gallon capacities. |
| Potable Water Storage and Distribution System (PWS/DS) | Total capacity will be dependent on the number and size of fabric tanks utilized; each capable of receiving and distributing water, both hose line and tank truck; water issued to tank trucks, water trailers, forward area water point supply system, or small unit containers; likely used for long-term water supply operations. |
| Forward Area Water Point Supply System (FAWPSS) | Portable, self-contained, and diesel-operated which dispenses potable drinking water; operated by a 125-gpm centrifugal pump; six 500-gallon water storage and dispensing drums are attached; drums provide water to the 125-gpm pump, which, through hoses and valves, pumps water to four distribution nozzles where the water is discharged. |
| Tactical Water Distribution System (TWDS) | Easily transportable water transport system consisting of pumping stations, storage assemblies, and distribution points; designed to distribute water up to 10 miles on level terrain. |
| Water Distribution and Waste Management System (WD/WMS) | Composed of three modules; primary means for the receipt and storage of bulk potable water, and for wastewater management for the Deployable Medical System hospital; total capacity of each unit is dependent on the size of fabric tanks used (usually 18,000-20,000 gph) |
| Load Handling System Water Tank Rack (HIPPO) | Not yet fielded but will consist of a 2,000-gallon, hard-walled, water tank rack with an integrated water pump. |
| 3,000-gallon Onion Tank | Easily transportable, manually inflatable/collapsible fabric water tank; packaged, the tank weighs 130 pounds, but filled with water, the tank weighs 25,020 pounds. |
| 400-gallon Water Trailers (a.k.a. Water Buffaloes) | M149A2 is a stainless steel tank; M1112 water trailer is a newer eight-wheeled water trailer, which has a cylindrical stainless steel tank and a wider footprint that makes it more stable during movement. |
| 900-gallon CAMEL | Not yet fielded but will replace the M149A2 and M1112 water trailers and has two 450-gallon pods, an integrated heater/chiller, and filling stands for individual soldiers - all on a trailer platform. |

Legend:
gpm = gallons per minute
gph = gallons per hour

#### 8.8.3.4 Bottled Water Suppliers

There is no Army, state, or federal regulatory requirement that calls for the issuance of bottled water under emergency conditions. However, alternate water supplies such as bottled water may be needed if a “Do Not Drink” or “Do Not Use” order is issued. Local bottled water suppliers may be good sources of emergency water. On Army installations, AAFES is a good local source for small quantities of bottled water. If bottled water suppliers are identified, contact information to include point of contact (POC) name, title, organization, work telephone number, DSN, and home telephone number as well as city and state are necessary. Typically, the organization responsible for logistics on post will have food service contracts in place for these types of emergencies. Reliance upon the purchase of bottled water at local, commercial facilities causes concern, as competition for these limited resources (e.g., the public and other businesses) will be great. If water from a commercial facility is required, a contract should be developed and put in place.

### 8.8.4 Nonpotable Water (Fire-fighting)

If a “Do Not Use” order is issued, the use of fire hydrants will be prohibited because of the potential to spread contaminated water. As a result, other water sources will need to be relied upon. These sources include neighboring fire departments, as well as swimming pools and surface water sources (e.g., lakes and rivers). These sources need to be identified in the ERP, to include quantities and locations.

### 8.8.5 Ice and Refrigeration Facilities

Vendors that sell and lease ice and refrigeration facilities (used to keep this ice cold) should be listed in the water ERP. Ice and refrigeration facilities are often overlooked in emergency planning but are necessary during disaster events. The installation logistics organization, specifically food services, would likely have contact information for local ice and refrigeration vendors.

### 8.8.6 Sanitation Facilities

The issuance of a “Do Not Use” order would prohibit the use of toilets on an installation. Likely, nonresidents of the installation would be dismissed; although, in the absence of sanitation facilities, portable toilets will need to be acquired for permanent residents. The ERP should provide a list of vendors for these units if a contract is not already established.

## 8.9 EMERGENCY NOTIFICATION LISTS

The ERP should include internal and external notification lists. Additional support organizations that should be listed are equipment and supply resources (vendors), local and regional law enforcement and emergency response units (e.g., local health department, FBI, EPA, state response team, WMD CST), technical assistance resources (e.g., APHC and the PHC), and local emergency management agencies.

## 8.10 EMERGENCY EQUIPMENT AND SUPPLIES

### 8.10.1 Equipment Inventory

All equipment that can be used during response and recovery operations should be listed and described (quantity, size, volume, length and weight). Organizations listed in Table 7 should be contacted to determine if repair, water production, water storage, transport, earth moving, power sources, or lighting can be provided.

**Table 7. List of Equipment to be Included in the ERP[a]**

| Organization Name | Description of Typical Equipment Available |
|---|---|
| DPW and/or Water System Operations and Maintenance | Piping (material, lengths, sizes), valves (material, lengths, sizes), hydrants, clamps (material, lengths, sizes), generators (capacity), backup/extra chemical feed systems (types), chemicals typically in storage (quantities, types), spare pumps (capacity) |
| Fire Department | Fire engines (types, water holding capacity), extra hose line (lengths, sizes) |
| Grounds Maintenance | Backhoes (types), front-end loaders (types), pump trucks (sizes), vacuum trucks (sizes), jet rodder trucks (sizes), scoop loaders (sizes), road graders (sizes), steam rollers (sizes), cranes, dump trucks, portable construction lights, generators |
| Logistics / Water Production and Storage Team | ROWPUs (capacity), water trailers (capacity), SMFTs (capacity), PWS/DS, extra hose line (sizes, lengths), bottled water (in stock), tanker trucks (capacity), radios/communications |
| Police | Portable lights(capacity), generators(capacity) |

Legend:
DPW = Department of Public Works
ROWPU = reverse osmosis water purification unit
SMFT = Semi-Trailer Mounted Fabric Tank
PWS/DS = Potable Water Storage and Distribution System
Note:
[a] Quantities of each type of equipment available should be noted.

### 8.10.2 Chemical and Equipment Vendors

Contact information for all water system equipment and chemical supply vendors should be provided in the ERP. During an emergency, one or more chemicals or types of replacement equipment may be needed. This list will provide the installation a quick and concise listing of vendors for the desired chemical or piece of equipment. Information that should be provided includes the company name, telephone number, city, state, and type of equipment support available. This information can be obtained from the water system manager and/or Contract Officer Representative and water system manager.

## 8.11 EXAMPLE FORMS AND SHEETS

A number of example forms are available which could/should be helpful in developing an ERP. Further, examples of public notification letters may be obtained from the state regulatory authorities or AWWA. Examples of the following are provided in Appendix E:

- Water System Information.
- Key Points of Contact.
- Alternative Water Sources.
- Emergency Equipment Listing.
- Summary of Recovery Operations.

This page is intentionally left blank.

# CHAPTER 9
# ERP TRAINING AND EXERCISES

## 9.1 FAMILIARIZATION, REVIEW, AND REHEARSALS

### 9.1.1 Familiarization

Once the water system ERP is developed, Army installations should ensure that each organization involved in an emergency event obtains a copy of the ERP and understands their roles and responsibilities.

### 9.1.2 Review and Rehearsals

The ERP should be reviewed and rehearsed at least annually as recommended by the EPA (reference 9). Periodic rehearsals are necessary especially since many management teams of Army water utilities are moving towards privatization. Privatization of an Army water system will require updates to the ERP as POCs will have changed.

## 9.2 Training Exercises

### 9.2.1 The Next Step

A water system ERP will help emergency responders during a water system emergency. Although, since the ERP is only a plan, all installations are strongly encouraged to conduct either a tabletop or field exercise after the plan has been developed. No plan is a good plan unless it has been tested and improved. Several water systems around the U.S. have conducted water emergency exercises.

### 9.2.2 Exercise Scope

Exercise execution should either include a meeting dedicated solely to reviewing the water system ERP or the execution of either a tabletop or field exercise with all organizations participating. An excellent exercise of the plan would include inviting representatives from the local FBI, state drinking water agency and health department, EPA field offices, and local emergency services.

### 9.2.3 Exercise Design Guidance

Guidance on executing tabletop exercises can be obtained from the installation EOC. Further guidance may be obtained from the state, EPA, or AWWA. The APHC highly recommends that a response to an intentional contamination event be included in the exercise.

### 9.2.4 After Action Review

An AAR should be conducted after each exercise. This review provides participants an opportunity to identify useful information in the ERP as well as recommend changes to improve the response effort. The AAR emphasizes player input to determine what happened, why it happened, and how it can be done better. AARs are player-conducted events with evaluator comments and input as a secondary by-product. The DPW should publish the results of the AARs (e.g., in the form of a memorandum). These reports should be furnished to all participants in the subject exercise. Objectives of subsequent exercises should be based upon command guidance, previous incidents results, and the results of the last exercise to make certain that training weaknesses are identified and corrected. Additionally, each organization should track improvements, changes, and corrections based on lessons learned cited in the AARs. The DPW is usually the organization responsible for tracking improvements, changes, and corrections on the water ERP based on lessons learned cited in AARs.

# APPENDIX A
# REFERENCES

1. *Public Health Security and Bioterrorism Preparedness and Response Act of 2002*, Public Law 107-188, 12 June 2002. https://www.energy.gov/sites/default/files/2014/03/f12/PL107-188.pdf

2. Memorandum, Assistant Deputy Under Secretary of Defense (ADUSD), 3 July 2003, subject: DOD Policy on Drinking Water Vulnerability Assessments and Emergency Response Plans.

3. Memorandum, Assistant Chief of Staff for Installation Management (ACSIM), 30 December 2003, subject: Updated Water System Vulnerability Assessment Requirements for Army Installations. Washington, D.C.

4. America's Water Infrastructure Act of 2018, Public Law 115-270, 23 October 2018. https://uscode.house.gov/statutes/pl/115/270.pdf

5. Department of the Army. 2008. Regulation 420-1, *Army Facilities Management*. http://www.apd.army.mil/usapa_home.asp

6. *M19 Emergency Planning for Water Utilities, Manual of Water Supply Practices, Fifth Edition.* Denver, Colorado: AWWA.

7. Department of the Army. 1982. Technical Bulletin, Medical 576, *Sanitary Control and Surveillance of Water Supplies at Fixed Installations.* http://www.apd.army.mil/usapa_home.asp

8. EPA. Office of Water. 2002. EPA 810-R-02-001, *Guidance for Water Utility Response, Recovery & Remediation Actions for Man-made and/or Technological Emergencies.* Washington, D.C.

9. EPA. Office of Water. 2003. EPA 810-F-02-007, *Large Water System Emergency Response Plan Outline: Guidance to Assist Community Water Systems in Complying with the Public Health Security and Bioterrorism Preparedness Response Act of 2002.* Washington, D.C.

10. EPA. Office of Water. 2003. Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents. Modules 1-6. Washington, D.C. https://www.epa.gov/waterutilityresponse/drinking-water-and-wastewater-utility-response-protocol-toolbox

11. EPA. Office of Water. 2004. EPA 816-R-04-002, *Emergency Response Plan Guide for Small and Medium Community Water Systems to Comply with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002.* Washington, D.C.

12. Northeast Rural Water Association (NeRWA). 1994. Small Water and Wastewater System Emergency Response Plan Template.

13. Association of State Drinking Water Administrators (ASDWA). April 2003. ASDWA Water System Emergency Response Plan Outline.

14. American Academy of Environmental Engineers. 1995. *Natural Disaster Experiences, How to Prepare Environmental Facilities for the Worst*. Denver: C&M Press.

15. U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM). Water Supply Information Paper No. IP 31-020, *Potable Water Emergency/Contingency Plan* Aberdeen Proving Ground, Maryland.

16. Department of Defense. 2000. Office of the Undersecretary of Defense. Overseas Environmental Baseline Guidance Document (OEGBD), 15 March 2000.

17. Safe Drinking Water Act, Public Law 93-523, 16 December 1974.

18. Baird R.B., A.D. Eaton, and E.W. Rice. 2017. Standard Methods for the Examination of Water and Wastewater, 23rd Edition. Washington, D.C.: American Water Works Association.

19. USACHPPM. May 2003. Technical Guide 284, Drinking Water Consumer Complaints: Indicators form Distribution System Sentinels. Aberdeen Proving Ground, Maryland.

20. California Utilities Association (CUA), AWWA, California Office of Emergency Services (COE). 1999. Emergency Planning Guidance, Public and Private Water Utilities.

21. "Emergency Plan Provisions." 2002. Code of Maryland Regulations, Title 26, Part 1, Subtitle 04, Chapter 26.04.01.22.

22. Department of the Army. 2007. Regulation 200-1, *Environmental Protection and Enhancement*. http://www.apd.army.mil/usapa_home.asp

23. Federal Emergency Management Agency (FEMA). 2003. FEMA 9230.1-PL, Federal Response Plan-Interim. Washington, D.C.

24. EPA. Office of Water. 2019. EPA 816-B-19-003, *Community Water System Emergency Response Plan, Template and Instructions*.

25. "How to Certify Your Risk and Resilience Assessment of Emergency Response Plans," EPA, last modified 3 June 2021. EPAhttp://www.epa.gov/waterresilience/how-certify-your-risk-and-resilience-assessment-or-emergency-response-plan.

# APPENDIX B

# EPA ERP CERTIFICATION LETTER

## CERTIFICATION OF COMPLETION OF AN EMERGENCY RESPONSE PLAN

## Certification of Community Water System Emergency Response Plan in Compliance with America's Water Infrastructure Act of 2018

This appendix provides a summary guidance for identifying the methods of certifying that an Emergency Response Plan has been developed and is available for use by the Community Water System, IAW the AWIA. Reference 25 provides the further helpful information. The preferred method of submission is electronic; however, submission by mail or email is acceptable. Provide certification to the EPA Administrator following this guidance. The following information is required to submit such a certification (extracted from reference 25).

### Part (A): Community Water System Identification

Community Water System Name:

Community Water System Complete Mailing Address:

Public Water System Identification Number:

Population Served:

### Part (B): Certification Date

Date of the certification:

### Part (C): Certification Statement

I, _____
*[Name of certifying official]*

hereby certify that the community water system named under Part A has completed an emergency response plan that incorporates findings of the risk and resilience assessment conducted under Section 2013(a) of America's Water Infrastructure Act of 2018 for such system (and any revisions thereto). This emergency response plan includes:

1. Strategies and resources to improve the resilience of the system, including the physical security and cybersecurity of the system;

2. Plans and procedures that can be implemented, and identification of equipment that can be utilized, in the event of a malevolent act or natural hazard that threatens the ability of the community water system to deliver safe drinking water;

3. Actions, procedures, and equipment which can obviate or significantly lessen the impact of a malevolent act or natural hazard on the public health and the safety and supply of drinking water provided to communities and individuals, including the development of alternative source water options, relocation of water intakes, and construction of flood protection barriers; and

4. Strategies that can be used to aid in the detection of malevolent acts or natural hazards that threaten the security or resilience of the system.

_____

Signature of Authorizing Official

# APPENDIX C

# EPA RECOMMENDED COMPONENTS OF AN EMERGENCY WATER COLLECTION AND TEST KIT

## (USEPA, Office of Water, EPA-817-R-08-003, Sampling Guidance for Unknown Contaminants in Drinking Water, February 2017)

## C-1. SAMPLE COLLECTION MATERIALS

- Field Resources and Documentation:
  - Custody tape (or seals) - 2 rolls
  - Lab marker - 2 (1 red, 1 black)
  - Sample Labels (48) 1" x 6.5"
- General Sampling Supplies:
  - Sample bottles:
    - 40-milliliter (mL) clear vial w/ Teflon™ septa (with and without preservatives)
    - 1-liter (L) amber bottle w/ Teflon liner and screw cap (with and without preservatives)
    - 1-L amber bottle silanized (with and without preservatives)
    - 125-mL natural High Density Polyethylene (HDPE) bottle (with and without preservatives)
    - 1,000-mL amber bottle, wide-mouth (with and without preservatives)
    - 2-L natural HDPE bottle
    - 120-mL coliform bottle sterile, 100-mL fill line with sodium thiosulfate
    - 250-mL Nalgene® wide-mouth bottle
    - 1 L natural HDPE wide-mouth bottle
    - 125-mL amber bottle
    - Blue capped autoclaved bottles 125-mL plastic for total and fecal coliform
  - Device for grab sampling
  - Small bottle attachment, snapper band
  - Large bottle attachment, snapper band
  - 20-L collapsible cubitainers
  - Lab grade tape
  - Collapsible cooler
  - Rigid cooler
  - 1-gallon zippered freezer bags
  - Thermometer (2), -20° C to 150° C red mineral
  - Paper towels
- Pathogen Sampling Supplies:
  - Tubing and clamp (1)
  - Ultrafiltration apparatus (1)
- Reagents (kept separate from the rest of the kit):
  - Laboratory grade water (5 gallons)
  - pH paper in ranges from 0–4 and 10–14
  - Sodium thiosulfate crystals (premeasured for addition to sample bottles)
  - Ascorbic acid (premeasured for addition to sample bottles)

  - Sodium sulfite crystals (premeasured for addition to sample bottles)
  - Potassium dihydrogen citrate (potassium citrate monohydrate) (premeasured for addition to sample bottles)
- Safety Supplies:
  - Splash resistant goggles
  - Disposable gloves, NDEX long cuff
  - Disposable shoe covers
  - Disposable laboratory coats
  - Clear, heavy duty plastic trash bags
  - Rinse water
  - Antiseptic wipes
  - Bleach solution (at least 5%)
  - Squirt bottle
  - First aid kit
  - Duct tape
  - Clear tape
  - Tape dispenser
  - Kimwipes® (smaller)
  - Bubble wrap bags
  - Flashlight
  - Extra batteries
  - Cordless high intensity spot-light

## C-2. RAPID WATER TESTING EQUIPMENT

- YSI 556 Multiparameter Probe (pH, conductivity, temperature, and DO)
- DR-2400 Portable Spectrophotometer (arsenic, cadmium, chromium, and nitrite)
- Rapid Toxicity Unit - ECLOX Water Test Kit
- Ricin BioTest Strips
- Portable Turbidimeter
- Digital Titration (Alkalinity Test Equipment)
- Smart 2 Colorimeter (free and total chlorine, ammonia, cyanide, and fluoride)

**C-3. FIELD SAFETY SCREENING EQUIPMENT.** Inspector EXP Digital Geiger Counter with External Pancake Probe.

# APPENDIX D

# INTERVIEW QUESTIONNAIRE FOR EMERGENCY RESPONSE PLANNING TEAM

## D-1. GENERAL

Has your water system ever had a potable water emergency caused by either a natural disaster (e.g., hurricane), vandalism, unintentional bacteriological contamination (positive coliforms), or attack? If so, please describe. What was your involvement? What was the involvement of other organizations that responded/took part in the effort (on and off post)?

Since the water vulnerability assessment, what actions were taken to better fortify the military water system and prepare for terrorist attacks?

What would your role be if a water system asset were destroyed? Contaminated? Attacked by cyber networks? Who would you contact if a water system emergency occurs?

What do you know about the water system? Have you ever visited the water treatment plant? Storage tanks? Other water facilities? Do you know where all of the water facilities are located? Including those off post?

Who would contact you if you suspected either contaminated drinking water, a reduction in water pressure, or water with a peculiar taste, odor, color, or texture?

Have you ever been asked to assist in the response to a water system problem?

How many years have you been in your field? In your current position? At your present employer?

Who has the authority to shutdown the water system and declare a “Do Not Use” order?

## D-2. TRAINING

Have law enforcement, security and the local emergency responders previously discussed how they would respond to a water system terrorist attack? Have there been any tabletop or field exercises?

Have you heard of/reviewed the U.S. Environmental Protection Agency (EPA) Contamination Threat Management Guide developed for responding to suspected or confirmed water system contamination?

Will an Incident Command System (ICS) be initiated during an emergency? Have you been trained on the ICS? Has the Directorate of Public Works (DPW) Chief?

Are water system manager, chiefs, DPW chiefs and managers, operating contractors, as well as the Public Health Program Chiefs aware of their responsibilities and duties in the ICS?

Is there a water system threat record sheet? Have you ever been trained on how to handle telephone threats? (Preferably by the police/law enforcement)

## D-3. EXISTING WATER SYSTEM EMERGENCY RESPONSE PLANS (ERP) AND STANDING OPERATING PROCEDURES (SOP)

Does the DPW/operating contractor and or emergency operations center (EOC) have a water system ERP? Have you ever seen it? If you could change add/delete one part of the existing ERP what would it be?

Where is the EOC located? Who's in charge of the EOC if it is activated? How is the EOC activated and who's responsibility is this?

Do you know if there is an emergency notification list for notifying the necessary personnel? Internal? External? How often is the call-list updated? Who is in charge of its update?

Do you have names and working telephone numbers of chemical suppliers?

How are drinking water customer complaints handled currently? Does Public Health Program receive them? Work Order Desk? DPW/operating contractor? Fire Department? Some or all of the mentioned? Are the recorded and reported to a single point-of-contact who is charged with tracking their frequency, occurrence, and investigation?

What "written" SOPs are in place that would help water system, PVNTMED, etc., personnel respond to a water system emergency?

## D-4. DETECTION OF CONTAMINATION

Do you have a plan in place to protect water facility assets in heightened THREATCON/ FPCON posture? Are these assets on the mission essential vulnerable assets (MEVA) or high-risk target (HRT) lists?

Is monitoring of the water system increased when THREATCON/FPCON levels increase? (e.g., water sampling frequency, patrols, and onsite investigations of customer complaints)

What laboratories are used to conduct routine bacteriological and chemical analyses for the water and wastewater system? Do you know what the capabilities of those labs are (e.g., list of contaminants they can detect)? Are these laboratories open 24 hours a day, 365 days per year? What happens if the emergency occurs on a holiday or weekend?

Are there any backup laboratories identified?

Have you ever been given a drinking water customer complaint? (e.g., taste, odor, color, clarity)? How do you handle it? Who do you report it to? Did/do you take water samples when you investigate?

Is there one central location for tracking and mapping ALL customer complaints? If no, how can it be implemented?

Have you read the USACHPPM Technical Guide 284 on how to better investigate and track customer complaints as indicators of water system contamination?

## D-5. RESPONSE EQUIPMENT, SUPPLIES, AND RESOURCES

Do you have any equipment, supplies, or resources that would be useful during an emergency? What equipment do you have available onsite if an emergency occurred? (SCBAs, earthmovers, generators, pumps, sampling bottles, etc.)

What quantity and types of water plumbing equipment and chemical supplies or on stock regularly? Is there a water system supplier contact list available?

## D-6. CONTINGENCY WATER SUPPLIES FOR POTABLE AND NONPOTABLE PURPOSES

Is there a connection with the post water system to a public or private water system off post? Has it ever been used? Have you ever physically opened/tested the valve?

Are there any reverse osmosis water purification unit (ROWPU) teams or possible military units that can treat, store, or distribute contingency drinking water supplies located on post? In the local community?

If you can supply water during an emergency, what quantity can you provide per day? On a short- or long-term basis?

If you can transport/store water in an emergency, how much water can you transport and/or store per day? How many vehicles and storage units do you have available?
What are the names of some local surface water sources located near or in the post? How far are they from post?

How many and where are swimming pools located on post?

## D-7. RESPONSE ORGANIZATIONS AND UNITS

How long will it take for you or a representative of your organization to respond onsite to water facilities (tanks, water treatment plant (WTP), source)?

Is there a Weapons of Mass Destruction (WMD) Civil Support Team in the region? What is it and where is it located?

Is there a local chemical, biological, radiological, nuclear, and explosives (CBRNE) team on post or within the region? Chemical Biological Incident Response Force (CBIRF) team?

How much time would it take for a fully outfitted CBRNE team to arrive at the water system?

What is your organization's role in a water system emergency?

Have you contacted any organizations outside the installation to provide any type of support if the water system is attacked? Not in service?

Are there any other organizations that you believe would/ could help during a water system emergency?

Who has jurisdiction if a criminal event occurs on the installation?

Are there any Memorandums of Understanding (MOU), Memorandums of Agreement (MOA), or Regional Assurance Acts (RAA) between the installation and your organization/company in the case of a water system emergency?

## D-8. LOGISTICS

If a contractor needs to come onto post to support the emergency situation, do they need to go through any protocols? Submit forms? Are there procedures already in place?

## D-9. PUBLIC NOTIFICATION

Who would notify the media if intentional contamination of the water system was suspected? Do you have scripted media notifications for suspected water system contamination? Do not use orders? Boil water advisories?

Do you have a list of media contacts on file (e.g., TV, radio, news, public access, megaphone)?

Is there a single location on/off post designated for the responding media representatives to broadcast from?

# APPENDIX E

# EXAMPLES OF EMERGENCY RESPONSE MANAGEMENT FORMS AND EQUIPMENT LISTING

## Water System Information

| | | |
|---|---|---|
| Public or Community Water System Identification Number | | |
| System name and address | | |
| Directions to water system office and/or WTP | | |
| Basic description of treatment processes and location of facilities | | |
| System owner (installation, contractor, etc.) – GOGO, GOCO, COCO | | |
| Number and size of system storage tanks | | |
| Maximum/peak water demands | | |
| Population served and estimated service connections | Residents<br>Employees<br>Industrial | Connections |
| Name, title, phone number of water system operations foreman | | |
| Name, title, phone number of water systems maintenance chief | | |

## Key Points of Contact

| EMERGENCY CONTACT LIST | | |
|---|---|---|
| **Name and Title** | **Responsibilities During Emergency** | **Contact Numbers** |
| DPW/Operating Contractor Water System Manager | • Overall management and decision making for the water system<br>• Call in and assign employees<br>• Notify Command and Staff<br>• Determines what internal and external resources are needed, in conjunction with Water Advisory Group<br>• Coordination with regulatory authorities (if needed)<br>• Coordinate with PAO regarding media and public notification; all information approved by Manager | Office: xxx-xxx-xxxx<br>Cell: xxx-xxx-xxxx |
| Water Treatment/Systems Operator | • Performs water systems operations<br>• Performs inspections and maintenance of water treatment, distribution, storage facilities, pressure and pump facilities<br>• Reports status, recommended actions, and critical information to water system manager | Phone: xxx-xxx-xxxx<br>Cell: xxx-xxx-xxxx |
| Water Treatment/Systems Operator | • Performs water systems operations<br>• Performs inspections and maintenance of water treatment, distribution, storage facilities, pressure and pump facilities<br>• Reports status, recommended actions, and critical information to water system manager | Phone: xxx-xxx-xxxx<br>Cell: xxx-xxx-xxxx |
| DPW O&M Office Administrator | • Responsible for administrative functions in the office<br>• Receives customer and vendor phone calls; maintains log of all calls received<br>• May provide pre-scripted responses or forward calls to PAO | Office: xxx-xxx-xxxx |
| DPW | • Responsible for water operations resources and personnel<br>• Responsible for plumbing operations and activities<br>• Directs use of personnel and equipment needed | Phone: xxx-xxx-xxxx<br>Cell: xxx-xxx-xxxx |
| Environmental Coordinator/Water Quality Manager | • Ensures that samples collected are analyzed by a certified laboratory<br>• Receives results and forwards to Water System Manager, Regulatory Authorities, Installation Commander | Phone: xxx-xxx-xxxx |
| DPW – Plumbing Shop | • Repair/replace water piping, valves, and devices from building connections with distribution system mains<br>• Trouble-shoot local water system issues in housing/buildings | Phone: xxx-xxx-xxxx |
| DPW Buildings and Grounds | • Assists with flushing of repaired/replace water lines<br>• Provide portable generators<br>• Provide temporary/portable lights<br>• Provide heavy equipment for excavation and filling of soils | Phone: xxx-xxx-xxxx |

| | | |
|---|---|---|
| Public Affairs Office (media and public announcements) | • Release all known information to the public and installation consumers<br>• Release information and status to the media, upon Command approval | Office: xxx-xxx-xxxx<br>Cell: xxx-xxx-xxxx |
| Department of Logistics | • Procure/assign portable generators or lights, where directed<br>• Obtain piping/equipment on quick turn-around basis, as needed<br>• Obtain and track support materials required | Phone: xxx-xxx-xxxx<br>Cell: xxx-xxx-xxxx |
| Installation Commander | • Kept abreast of system status<br>• Impact of emergency on mission-essential operations/activities<br>• Approve/direct use of fiscal and manpower resources | Phone: xxx-xxx-xxxx |
| Military/DOD Police | • Secure personnel and equipment performing emergency activities<br>• Escort vendors and equipment to repair sites<br>• Traffic control<br>• Perform investigation of criminal/terrorist actions | Office: xxx-xxx-xxxx |
| Installation Public Health Program | • Provide assistance regarding the potential impacts of emergency to consumer's health<br>• Provide basic water quality assessment and bacteriological sampling/analysis for key locations across installation | Phone: xxx-xxx-xxxx<br>Cell: xxx-xxx-xxxx |
| Regional Public Health Command/Army Public Health Center | • Provide assistance to installations re the development and implementation of ERPs<br>• Provide expertise to assist installations with response and recovery actions<br>• Assist with technical and Public Health concerns | PHC: xxx-xxx-xxxx<br>APHC: xxx-xxx-xxxx |
| State/Local Public Health Agency | • Assist in providing health advisories and guidance<br>• Provide assistance in notification of employees/personnel<br>• Assist in approval of water supplies and return to normal operations | Phone: xxx-xxx-xxxx |
| Installation Fire Department | • Coordinate problematic issues with water flow/availability<br>• Coordinate assistance re emergency situations (flooding, water storage)<br>• Plan for tankers/emergency water supplies and personnel for fire suppression if installation water supply is unavailable | Phone: xxx-xxx-xxxx |
| Utilities Director – Neighboring Communities | • If interconnection, availability of water for emergency<br>• Negotiate amount of water that can be transferred during emergencies<br>• Contract for long-term or short-term support<br>• Determine metering and costs<br>• If no interconnection, potential availability of water to be trucked in to installation | Phone: xxx-xxx-xxxx |

| | | |
|---|---|---|
| Local QM Unit/Water Supply Co. | • Availability of field water equipment to supply garrison<br>• Establish water distribution points<br>• Potentially provide field water equipment and operators to offer emergency water supplies to installation activities/personnel (Reverse Osmosis Water Purification Units, Tactical Water Purification Systems, etc.)<br>• Establish water distribution protocols/procedures<br>• Approval of containers used<br>• Seek state regulatory approval for use and discharge | Phone: xxx-xxx-xxxx |
| Local QM Unit/Water Supply Co. | • Availability of field water equipment to supply garrison<br>• Establish water distribution points<br>• Potentially provide field water equipment and operators to offer emergency water supplies to installation activities/personnel (Reverse Osmosis Water Purification Units, Tactical Water Purification Systems, etc.)<br>• Establish water distribution protocols/procedures<br>• Approval of containers used<br>• Seek state regulatory approval for use and discharge | Phone: xxx-xxx-xxxx |
| AAFES – Bottled Water supplies | • Availability of bottled water in stock or in Commissary/PX stores<br>• Accessibility to additional supplies<br>• Suppliers approved by state and/or Vet. Services within Army<br>• Coordinate with DPW/Installation Authorities regarding designated water distribution points<br>• Potable water transported in approved vehicles only | Phone: xxx-xxx-xxxx |
| Bottled Water Vendor/Store | • Availability and delivery of bottled water supplies<br>• Deliver water to requested locations | Phone: Xxx-xxx-xxxx |
| External Contractors – large-scale system repair | • Provide heavy equipment and operators to support repair or replacement of water system materials<br>• Provide flushing of equipment installed and bacteriological assessment of water<br>• Return system to normal operations as quickly as possible<br>• Comply with all pertinent Army and state regulations/guidelines<br>• Coordinate with DPW and onsite authorities<br>• Work through COTR | Phone: xxx-xxx-xxxx |
| Vendor – Piping materials | • Establish contract to supply materials, upon request<br>• Provide piping, hydrants, valves<br>• Haul materials to site or Department of Logistics, as needed | Phone: xxx-xxx-xxxx |

| | | |
|---|---|---|
| Vendors – Water Treatment Chemicals | • May be different vendors identified<br>• Chlorine/calcium hypochlorite<br>• Coagulants<br>• Filter media<br>• Corrosion control chemicals | Phone: xxx-xxx-xxxx |
| Power Authorities (within Installation and commercial suppliers) | • Provide support/assistance for power outages impacting water system equipment/appurtenances<br>• Assess wiring/electrical stability<br>• Assess security systems and alarm systems<br>• Evaluate surge protection of equipment and computer/IT systems | Phone: xxx-xxx-xxxx |
| National Weather Service | • Warnings for potential of severe weather<br>• Routine updates of localized conditions | Phone: xxx-xxx-xxxx |
| State Regulatory Authority – Water | • Notification of disruption of water supplies<br>• Approval of remediation (recommended, not required)<br>• Approval of water quality after repairs/replacement | Phone: xxx-xxx-xxxx |
| State Health Department | • Assist with delineation of adverse health impacts of possible contaminants in the drinking water<br>• Approval of use of drinking water | Phone: xxx-xxx-xxxx |
| State-certified Laboratory | • Provide sampling containers for the designated parameters<br>• Possibly provide assistance for sampling (as needed/contracted)<br>• Maintain chain of custody of samples to lab<br>• Analyze all samples submitted to the laboratory using state-certified methods<br>• Report data back to installation authorities in the agreed-upon time frame | Phone: xxx-xxx-xxxx |
| Regional Water Emergency Consortium | • Share mutual support during emergencies regarding technical support<br>• Share emergency resources and equipment, as requested and capable (e.g., water tanker trucks, bottled water, emergency fire suppression, etc.) | Phone: xxx-xxx-xxxx |
| Other Vendors/ Contractors | • Identify other potential vendors or contractors needed to support emergency situations on the installation<br>• Examples include: pump specialists, external/portable generators and fuel supplies | Phone: xxx-xxx-xxxx |

## Alternative Water Sources

| | Contact | Delivery/Distribution |
|---|---|---|
| AAFES – bottled water | | |
| Bottled water – store or commercial vendor | | |
| Interconnection | | Tie-in responsibility. |
| Wells – emergency power and fuel | | |
| Bulk water | | |
| Army equipment – TWPS, trailers, water storage | | |

## Emergency Equipment

Water Treatment Plant:

- Chemicals – 30-day supply
- Replacement valves
- Portable pumps
- Emergency generators and fuel (or fuel source)
- Monitoring kits and reagents to support basic operational monitoring

Distribution System:

- Piping (match materials in system and/or stockpile Polyvinyl Chloride [PVC] piping – various sizes to match those in system)
- Flow control valves (varying sizes to match system)
- Portable pumps and pressure gauges
- Piping “sleeves” (to repair isolated break)
- “Glue” or joint compound to interconnect piping segments and valves
- Backhoes
- Front end loaders
- Bulldozers
- Cranes (to lift and locate large piping sections)
- Clamps (to secure sleeves and piping segments)
- Calcium hypochlorite (to ensure disinfection of repaired/replaced segments of pipe)

## Recovery Operations

| Repair/replacement actions Undertaken | Assessment of actions |
|---|---|
| | |
| | |
| | |
| | |
| | |

# GLOSSARY

## PART I – ABBREVIATIONS

**AAFES**
Army and Air Force Exchange Service

**AAR**
After Action Review

**ACSIM**
Assistant Chief of Staff for Installation Management

**ADUSD**
Assistant Deputy Under Secretary of Defense

**APHC**
Army Public Health Center

**AR**
Army Regulation

**ARNG**
Army National Guard

**ASDWA**
Association of State Drinking Water Administrators

**AWIA**
America's Water Infrastructure Act of 2018

**AWWA**
American Water Works Association

**CDC**
Centers for Disease Control and Prevention

**CBIRF**
Chemical Biological Incident Response Force

**CBRNE**
Chemical, Biological, Radiological, Nuclear, and Explosives

**COE**
U.S. Army Corps of Engineers

**CONUS**
Continental United States

**CP**
Command Post

**CST**
Civil Support Team

**CUI**
Controlled Unclassified Information

**DA**
Department of the Army

**DOD**
Department of Defense

**DPTMS**
Directorate of Plans, Training, Mobilization, and Security

**DPW**
Directorate of Public Works

**EOC**
Emergency Operations Center

**ERP**
Emergency Response Plan

**EPA**
U.S. Environmental Protection Agency

**FAWPSS**
Forward Area Water Point Supply System

**FBI**
Federal Bureau of Investigation

**FEMA**
Federal Emergency Management Agency

**FPCON**
Force Protection Conditions

**FRP**
Federal Response Plan

**GAC**
Granular Activated Carbon

**GC**
Garrison Commander

**GIS**
Geographical Imaging System

**GOCO**
Government Owned, Contractor Operated

**GOGO**
Government Owned, Government Operated

**HAZMAT**
Hazardous Materials

**HRT**
High-risk Target

**HMMWV**
High Mobility Multipurpose Wheeled Vehicle

**HQ**
Headquarters

**HQDA**
Headquarters, Department of the Army

**IAW**
In Accordance With

**IC**
Incident Commander

**ICS**
Incident Command System

**ID**
Identification

**IOC**
Installation Operations Center

**LEPC**
Local Emergency Planning Committee

**LWP**
Lightweight Water Purifier

**MACOM**
Major Army Command

**MEVA**
Mission Essential Vulnerable Assets

**MOA**
Memorandum of Agreement

**MOU**
Memorandum of Understanding

**MP**
Military Police

**MSDS**
Material Safety Data Sheet

**MWR**
Morale Welfare and Recreation

**NBC**
Nuclear, Chemical, Biological

**NCP**
National Contingency Plan

**OEGBD**
Overseas Environmental Governing Baseline Guidance Document

**OSC**
On-Scene Coordinator

**PAO**
Public Affairs Office

**PHC**
Public Health Command

**PPE**
Personal Protective Equipment

**POC**
Point of Contact

**PVNTMED**
Preventive Medicine

**PWS/DS**
Potable Water Storage and Distribution System

**R&R**
Risk and Resilience

**ROWPU**
Reverse Osmosis Water Purification Unit

**SCADA**
Supervisory Control and Data Acquisition Systems

**SDWA**
Safe Drinking Water Act

**SMFT**
Semi-Trailer Mounted Fabric Tank

**SOP**
Standing Operating Procedure

**TB MED**
Technical Bulletin Medical

**TG**
Technical Guide

**TO&E**
Table of Organization and Equipment

**TWDS**
Tactical Water Distribution System

**TWPS**
Tactical Water Purification System

**USACHPPM**
U.S. Army Center for Health Promotion and Preventive Medicine

**WMD**
Weapons of Mass Destruction

**WTP**
Water Treatment Plant

## PART II – TERMS

**Advisory**
A non-regulatory document that communicates risk information to those who may have to make risk management decisions.

**Confirmed Incident**
A water system attack or water contamination incident is confirmed if the information collected over the course of the threat evaluation provides definitive evidence that the water system has been attacked and/or contaminated.

**Contaminant**
Any physical, chemical, biological, or radiological substance or matter that has an adverse effect on air, water, or soil.

**Contamination**
Introduction into water, air, and soil of microorganisms, chemicals, toxic substances, wastes, or wastewater in a concentration that makes the medium unfit for its next intended use. Also applies to surfaces of objects, buildings, and various household and agricultural use products.

**Credible Threat**
A water system attack or water contamination incident is characterized as credible if information collected during the threat evaluation process corroborates information from the threat warning.

**Decontamination**
Removal of harmful substances such as noxious chemicals, harmful bacteria or other organisms, or radioactive material from exposed individuals, rooms and furnishings in buildings, or the exterior environment.

**Disinfectant**
A chemical or physical process that kills pathogenic organisms in water, air, or on surfaces. Chlorine is often used to disinfect sewage treatment effluent, water supplies, wells, and swimming pools.

**Emergency Operations Center (EOC)**
A pre-designated facility established by an agency or jurisdiction to coordinate the overall agency or jurisdictional response and support to an emergency.

**Hazard**
A source of potential damage that interferes with the ability to deliver potable water of adequate quality, quantity, and/or pressure.

**Hazardous Waste**
By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. Possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity) or appears on special U.S Environmental Protection Agency (EPA) lists.

**Hotline**
The Hotline separates the Contamination Reduction Area (which may actually have contamination in it) from the potential contaminated area.

**Incident Command System**
A standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated organizational structure appropriate for the complexity and demands of single or multiple incidents without being hindered by jurisdictional boundaries.

**Incident Commander (IC)**
The individual responsible for the management of all incident operations.

**Installation Operations Center (IOC)**
Same as the EOC. A pre-designated facility established by an agency or jurisdiction to coordinate the overall agency or jurisdictional response and support to an emergency.

**National Response Center**
A joint EPA and U.S. Coast Guard (USCG) Communications Center that takes the legally required reports of oil or hazardous substance spills or releases at or above the reportable quantities and communicates these to the pre-designated on-scene coordinator for their action.

**On-scene coordinator (OSC)**
As defined by the National Contingency Plan (NCP), the OSC is the Federal official predesignated by EPA or the USCG to coordinate and direct Federal responses under subpart D of the NCP, or the official designated by the lead agency to coordinate and direct removal actions under subpart E of the NCP, Department of Defense and Department of Energy are included as OSC under subpart E.

**Possible Threat**
In the context of the threat evaluation process, a water system attack and/or contamination threat is characterized as possible if the circumstances of the threat warning appear to have provided an opportunity for contamination.

**Potable Water**
Water that is safe for drinking and cooking.

**Safe Water**
Water that does not contain harmful bacteria, toxic materials, or chemicals and is considered safe for drinking even if it may have taste, odor, color, and certain mineral problems.

**Threat**
An indication that a harmful incident, such as contamination of the drinking water supply, may have occurred. The threat may be direct, such as a verbal or written threat, or circumstantial, such as a security breach or unusual water quality.

**Threat Warning**
An unusual occurrence, observation, or discovery that indicates a potential attack and/or contamination incident and initiates actions to address this concern.

**Water Supplier**
One who owns or operates a public water system.

**Water Supply System**
The collection, treatment, storage, and distribution of potable water from source to consumer.