

For Hospitals and Healthcare Facilities

# Grab-and-Go Summary







### **Introduction**

This Emergency Water Supply Planning Guide (EWSP) for Hospitals and Healthcare Facilities Grab-and-Go Summary is meant to provide guidance to hospitals and healthcare facilities to prepare for a water supply interruption, outage, or emergency. It is a condensed version of the more extensive and detailed EWSP document, which is available for download at:

https://www.cdc.gov/healthywater/pdf/emergency/emergency-water-supply-planning-quide-2019-508.pdf.

While the Summary is not exhaustive, it does provide hospitals and healthcare facilities with the essential information they need to understand the purpose and overall approach to planning for an emergency water supply. It could also be used as a quick reference guide in the event of a water supply interruption, outage, or emergency.

Lastly, this Summary can act as a companion document to those who have read the full EWSP, but would like a more condensed version to review when necessary.

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### **Executive Summary**

In order to maintain daily operations and patient care services, healthcare facilities should develop an Emergency Water Supply Plan (EWSP) to prepare for, respond to, and recover from a total or partial interruption of the water supply. An EWSP provides a road map for a healthcare facility's response and recovery efforts in the event of a water supply interruption by providing the guidance to assess water usage, response capabilities, and water alternatives.

The interruption or total loss of a water supply can be caused by several types of events including natural disasters, a water system failure or contamination, construction damage, or an act of terrorism. In the case of some natural disasters—such as a hurricane or flood—a facility and the water system may have a few days of warning. These events allow more time for preparation which typically speeds up response. In other cases—such as earthquakes, tornados, external/internal water contamination, or the accidental rupture of a distribution pipe during construction—a facility may have little or no prior warning. Because water supplies can and do fail, it is imperative to understand and address how these interruptions impact patient safety, quality of care, and the operations of your facility.

An EWSP will vary from facility to facility based on site-specific conditions. For a small facility, one individual may perform multiple functions, and the process may be relatively simple. However, for a large regional hospital, multiple parties will need to work together to develop an EWSP. Regardless of size, a robust EWSP must be prepared to ensure patient safety and quality of care while responding to and recovering from a water interruption.

Standards of the Joint Commission (EM.02.02.09) and the Center for Medicare and Medicaid Services (CMS) Conditions for Participation/Conditions for Coverage (42 CFR 482.41) require hospitals to address the provision of water as part of the facility's Emergency Operations Plan (EOP). Two elements of performance for Standard EM.02.02.09 address water needs and divide them into the following categories:

- Consumption and essential care activities
- Equipment and sanitary purposes.

## **Examples of activities that would be impacted by a water interruption**

## Consumption and essential care

- Drinking at faucets and fountains
- Food preparation
- Handwashing
- Wound care
- Emergency surgery

## **Equipment** and sanitary purposes

- Flushing toilets
- Bathing patients
- Fire suppression sprinkler systems
- Heating, ventilation, and air conditioning



A Florida hospital lost water service for 5 hours due to water main break



A hospital in Texas lost water service for 48 hours due to an ice storm that caused a citywide power outage that included the water treatment plant.



A 2014 chemical spill in West Virginia contaminated a water supply for roughly 300,000 residents and affected 10 hospitals in the area.

### **Overview of the Plan Development Process**



The process of developing an EWSP requires the participation and collaboration of many individuals and stakeholders. The EWSP guide breaks down the development of an EWSP into four main steps:

#### STEP 1

**ASSEMBLE**EWSP team and gather documents

#### STEP 2

**UNDERSTAND**Understand water usage with audits

#### STEP 3

ANALYZE emergency water supply alternatives

#### STEP 4

**DEVELOP** and exercise your EWSP

## STEP 1: Assemble EWSP team and gather documents

Identify appropriate staff members who will be responsible for the development of the EWSP and assemble documents about the facility and its water usage. Gathering expertise from a range of individuals will ensure a comprehensive and robust plan. Below are some examples of the areas of expertise that should be represented on your team and suggestions as to which staff members may be best suited to provide input:

- Facility Management
  - Engineering or Plumbing Supervisor
- Infection Control and Prevention
   Infection Control Director or Specialist
- Medical Services
  - Chief of Surgery
  - Chief of Medicine
- Emergency Preparedness
  - Emergency Preparedness Coordinator
- Representatives from External Partners
  - Local drinking water utility
  - State drinking water agency
  - ▶ Public health department
  - Local fire department

- ▶ Water reclamation/purification department
- Emergency Manager
- ▶ Representative of external dialysis clinic

## **STEP 2: Understand water usage** with audits

A Water Use Audit provides a series of steps/actions to help a facility to determine its critical emergency water needs by quantifying the details of its water use and determining where it is essential and where it can be restricted.

## STEP 3: Analyze emergency water supply alternatives

Analyze other water supply options, such as bottled water and back up groundwater wells.

## STEP 4: Develop and exercise your EWSP

Based on analysis of the water use audit and the availability of alternate emergency water supplies, develop a written EWSP for the facility. Exercise the plan annually and make any adjustments as needed. A "hot-wash" and after-action report should be conducted immediately after the exercise. Revise the EWSP in the event of a significant facility expansion/modification or after a water supply interruption.

## STEP 1

**ASSEMBLE**EWSP team and gather documents

The EWSP should include the elements listed below. This list is not exhaustive, so other items may need to be considered. (See page 10 of EWSP document)

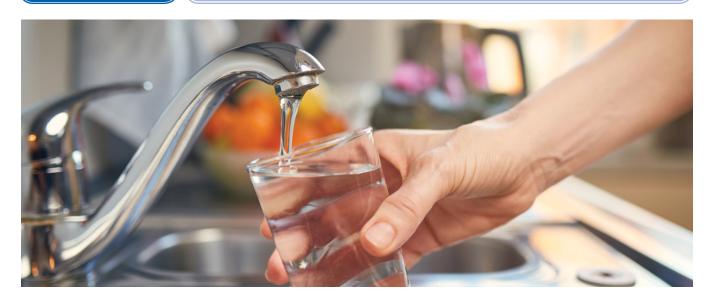
Facility d	lescription:	Water Supply & Demand			
Population Ser	ved	SOURCE	DEMAND		
☐ Urban	☐ Mixed	Source Description			
☐ Suburban	☐ Age Group:	Supplier Contacts			
<b>☐</b> Rural					
Essential Servic	ces	Meter (S)			
<b>☐</b> Medical	☐ Trauma		elements listed below. This list is not exhaustive,		
☐ Surgical	☐ Burn	so other items may need to be			
Pediatrics	☐ ICU	Other documents to also	include:		
Obstetrics	☐ Dialysis	Facility drawing(s)  Photos	☐ Diagrams		
<b>□</b> ER	OTHER	Copies of contracts			
Bed Count and	Distribution	Bottled water	Mutual aid agreements		
		☐ Tankers	Portable water treatment units		
AREA BED	COUNT	Equipment/material/processe	es that use water		
Medical		☐ HVAC	☐ Laboratory equipment		
Surgical		☐ Food prep	■ Water-cooled compressors		
Surgical		_ Laundry	Plumbing fixtures		
Pediatrics		☐ Hemodialysis	☐ Other		
<b>Obstetrics</b>			an—to prevent possible reversal of water flow mination that can occur from unwanted pressure		
ER			ve exercising is a routine scheduled maintenance		
Trauma		operation	en and closing water valves to ensure proper		
Burn		☐ Water supply alternativ			
		•   •	—address treatment and water quality testing		
ICU		· ·	<b>ne</b> —the EWSP should be part of, and ion with, the facility's overall EOP and Incident		
Dialysis			ion. The communications plan should be part of		
<b>Other</b>		☐ <b>Recovery plan</b> —returnir	ng to normal operations		
Total			■ Post-incident surveillance plan—guidance for detecting any increase in healthcare-associated illness due to biological/chemical agents in the wate		
footage of facility			■ EWSP evaluation and improvement—guidance and protocols for testing and exercising the plan and refining it		

#### STEP 2

**UNDERSTAND**Understand water usage with audits

See page 11 of EWSP document. The Water Use Audit provides a series of steps/actions that will enable a facility to determine its critical emergency water needs by quantifying the details of its water use and determining where it is essential and where it can be restricted.

This audit can also help identify water conservation measures in day-to-day operations. Reducing routine water usage can conserve energy, reduce long-term costs, and increase a facility's resiliency during an emergency.



#### A water use audit work plan typically includes FIVE PHASES:

#### PHASE 1

Determine EWSP team and gather documents

#### PHASE 2

Identify essential functions and minimum water needs

#### PHASE 3

Identify emergency water conservation measures

#### PHASE 4

Identify alternative water supplies

#### PHASE 5

Develop an emergency water restriction plan

#### **Phase 1:** Determine water usage under normal operating conditions

#### **Before Starting**

- ☐ Identify involved personnel
- ☐ Establish/confirm points of contact
- Obtain information about the facility's operational needs under average and surge conditions
- ☐ Gather lists of all the facility's water-using buildings, locations, equipment, and systems

#### Collect

- ☐ Facility drawings
- Water meter records
- ☐ Water surveys
- ☐ Water and sewer bills from the past 12 months

When estimating the overall amount of water used per day under normal operating conditions, include information from water meter records for permanently installed flow meters as well as water consumption estimates for each functional area/department based both on usage estimates and on knowledge of actual direct water usage. Where water usage cannot be measured directly, it can be estimated based on equipment design information, frequency and duration of use, interviews with the staff, and standard accepted water consumption values for common uses. Some facilities may be able to use wastewater discharge reports as a mechanism to back-calculate water usage.

### **PHASE 1:** Water Use Audit Form

		P	OPULATIO	N		
Date Au	iditor(s)	Building # Departme	nt Lev	vel/Wing D	epartment Function	
How many major wactivities in the dep			unction of activity try per activity)			
Full-time emplo	yees	Inpatient	s		Outpatients	
ТҮРЕ	AMOUNT	ТҮРЕ	A	MOUNT	ТҮРЕ	AMOUNT
8-hour shifts	hour shifts Occupancy rate Outpatient Stay (hours)					
12-hour shifts		Visitors			Visitors —	
Part-time		Visitor Stay	(hours)		Visitor Stay (hours)	
How long can outp	atients be temp	orarily postponed?				
Description of activ	ity					
Why is it considered	d critical?					
Quantity						
Faucets	Urinals	Toilets	Showers	Other	Other	
radects	Officials	lollets	JIIOWEIS	_ Other	Other	
How much water is  How long is water  How many times p	used per activity er day/week/mo	(hrs./mins.)	□No			
How long can the a	activity be temp	orarily postponed?				
Are there waterless	alternatives? [	Yes No				
Is the process depe	ndent on water	use in the other hosp	dept.?			
How long can the p	orocess operate	without the need for	outside water use	?		
Is it allowable for the air temp. to increase temporarily without adversely affecting health or safety?    Yes    No						
Comments:						

### Step 2: Understand Water Usage With Audits

#### **PHASE 1: Water Use Audit Form (continued)**

The previous page provided an example of a water use audit form that could be used to obtain information for various functional areas/departments. Although each facility has unique attributes,

a typical facility will need to develop estimates of water usage for the functions outlined below.

#### Tip:

**The estimates from each building/section** should be compared to the total meter readings for accuracy.

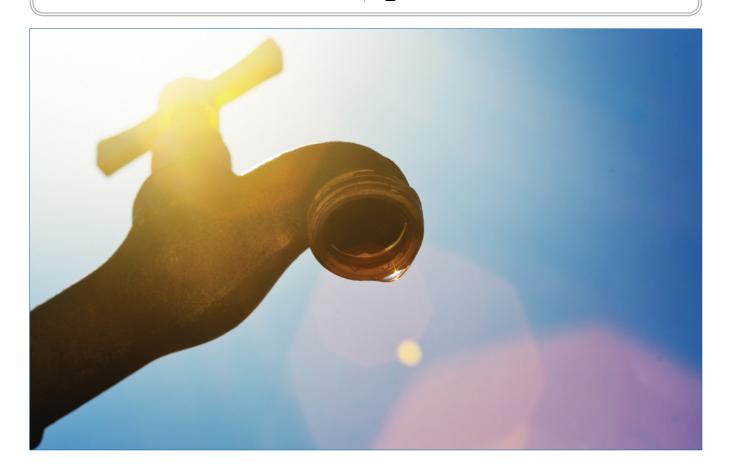
**Ideally, the total estimated amount of water being used** by the facility and individual functions should equal the amount from the meter readings.

Meter readings often show higher water usage due to "unaccounted-for water", which can result from water leakage, uncertain estimates, and missed categories of usage.

When reasonable estimates cannot be made based on usage information, or when the unaccounted-for water exceeds 20% of the meter readings, a facility may decide to use a portable flow meter.

#### **Facility Usage Facility Usage** ☐ Air-conditioning Outdoor irrigation systems ☐ Drinking fountains Patient floors Boilers Pharmacy ☐ Fire suppression ☐ Dietary sprinkler system Dishwashing Dialysis services Surgery ☐ Vacuum pumps ☐ Laundry ☐ Eye-wash stations □ Radiology ☐ Water system flushing ■ Autoclaves ☐ Ice machines ☐ Toilets, washrooms, ☐ Water-cooled air showers ☐ Medical equipment ☐ Laboratory compressors ☐ Cooling IT equipment

☐ Patient decontamination



### Step 2: Understand Water Usage With Audits

#### PHASE 2: Identify essential functions and minimum water needs

Identify which functions are essential to protect patient health and safety and which functions can be temporarily restricted or eliminated in the event of an interruption in the facility's water supply; determine the steps required to restrict or eliminate the non-critical functions temporarily.

Facility functions and their corresponding water demands can be prioritized so that the plan can accommodate water emergency situations ranging from minimal to total water service loss (e.g., reduced pressure for a limited number of hours, loss of public water supplies following a major disaster, etc.). Classify functions by asking these questions:

- Is the function essential to total facility operations?
- Is the function essential to specific operations inside the facility or a particular building?

Essential and critical functions can sometimes be consolidated into a limited number of buildings and/or limited areas of a building to further reduce emergency water needs. **Caution:** Consolidation of functions and shutting off water to individual buildings or areas of a building requires a detailed understanding of the facility's plumbing system, including locating and testing shutoff valves to determine if they work as expected.

In addition, the facility should consider the following:				
Areas and/or functions that may not be available during a water supply outage (e.g., the fire suppression sprinkler system, water-cooled medical air pressure and suction systems).	Provisions that already exist or need to be constructed to allow for the use of emergency water supplies (e.g., appropriate pipes, valves, connections, and backflow prevention devices to receive and use water			
Area(s) that can be used as helicopter landing zones if the existing landing zone is on the roof of a building and the fire suppression sprinkler system is inoperative.	from tanker trucks).  Steps that need to be taken to allow pressurization of the critical portions of the facility's water distribution system			
Steps that can be taken to isolate and eliminate use of selected cooling towers and/or to reduce water consumption in critical cooling towers (e.g., increased cycles of concentration).	while using an emergency water supply (e.g., closure of urinal flush valves that normally can require a minimum of 30 pounds per square inch [psi] pressure to close).			

#### **PHASE 2: Fill-in matrix**

Functions	Water Needs Under Normal Operating Conditions (gpd)	Waterless Alternative? (Yes or No)	Water Needs Under Water Restriction Situation (gpd)
Building			
HVAC			
Fire suppression			
Dietary			
Sanitation			
Drinking water			
Laundry			
Laboratory			
Radiology			
Medical care			
IT equip. cooling			
Other			
Other			

**Total minimum water needs** 

#### **PHASE 3:** Identify emergency water conservation measures

After estimating the normal water usage patterns, the facility must determine what emergency water conservation measures can be used to reduce or eliminate water usage within each of its departments to meet its minimum water

needs. The facility can calculate the total amount of water that will be conserved by implementing the measures. Departments can also consider developing long-range plans to replace equipment dependent upon water.

#### **Examples of Water Conservation Measures**

- Canceling elective procedures
- Using waterless hand hygiene products, when safe to do so
- Sponge-bathing patients
- Using disposable sterile supplies
- Using portable toilets
- Transferring noncritical patients to unaffected facilities
- Limiting the number of Emergency Department (ED) patients
- Using the ED to triage patients for transfer to other appropriate facilities
- Using single-use dialyzers and suspending the hemodialyzer re-use program
- Postponing physiotherapy services that require hydrotherapy
- Shutting off the water supply to buildings that do not support critical functions



#### PHASE 4: Identify emergency water supply options

During a water restriction, emergency, or outage, efforts to restore or maintain all or part of a facility's operations will require an alternative water supply of sufficient quantity and quality, as well as the means to introduce such water into the

areas of the facility where it is needed. The EWSP Team should check with the water supplier and the regional emergency management agency to arrange for or confirm the availability of alternative water supplies sufficient to meet the facility's needs.

Storage Areas:	Installations for Receiving Water:
☐ Tank	Appropriate connections
☐ Swimming Pools	☐ Valves
☐ Disposable Pools	☐ Backflow prevention devises
Other:	Pressurization
Alternate Emergency Water Supply:	Other:
☐ Isolation of nearby storage tank	
☐ Interconnection with nearby water supplier	
Other:	

The EWSP Team should identify what provisions exist or would need to be installed to enable receipt and use of emergency water supplies.

### Step 2: Understand Water Usage With Audits



#### **PHASE 5:** Develop an emergency water restriction plan

A water restriction plan can help guide decision-making and appropriate response actions during a loss of water supply. Faced with a water outage, facility staff must quickly assess the availability of water and determine at what level and for how long it can continue functioning.

If the expected water supply loss will be greater than the available volume of water that can be provided, mandatory water restriction measures must be implemented.

The water restriction plan should include criteria for determining when to enact restriction measures and may include various levels of response based upon the expected duration and severity of the water supply loss.

To further reduce demand on the available water supply, consider limiting visitors and to encouraging nonessential staff to work from home. Limit the use of restrooms to those with toilets that use a low water volume.

Facility management should establish standing contracts to ensure the availability of emergency support services, such as portable toilets, instrument sterilization, medical supplies, meal preparation, and potable water delivery via tanker truck or other means during an emergency water outage.

Information from the emergency water restriction plan will be used in the development of the EWSP and EOP.

Volume of Water Available:				
Inter-connected water system				
Storage Tanks				
Reservoirs				
Wells Volum	e of Water Available:			
OTHER: Expecte	ed duration of outage			
Collect information on the number and status of patier at the time of the outage.	ts, staff, and others at the facility			
at the time of the outage.				
Limiting water use to critical services and suspend nor	nessential services:			
<ul> <li>Accelerate patient discharge based on sound clinical judgment</li> </ul>	☐ Determine clinic services that can be suspended			
Supplies, materials, and other measures that limit or do not require water use:				
☐ Use alcohol-based hand sanitizers	Only heat/cool essential areas and buildings when possible			
Sponge bathe patients	☐ Close nonessential areas within essential buildings			
☐ Limit food preparation to meals-ready-to-eat (MREs)	☐ Consolidate floors and wings having low patient populations			
☐ Use disposable plates, utensils, silverware, and similar items whenever possible	<ul> <li>Check for leaks and correct plumbing deficiencies, preferably well before a water emergency occurs</li> </ul>			

### Step 3: Analyze Emergency Water Supply Alternatives

#### STEP 3

ANALYZE emergency water supply alternatives (See page 15 of EWSP document) If the facility management is not assured that the problem can be fixed in 8 hours or less, they should institute the short-term response and prepare to implement their longer term water emergency response if it becomes necessary.

If a water main break is the cause of the water supply interruption, part of the initial assessment will be to determine if the break is on the facility's property or within the distribution system of the water supplier. Offsite water main breaks emphasize the need to have good communication channels in place with the water supplier and local regulatory agencies before, during, and after an event.

Healthcare facilities should coordinate their response and recovery efforts with the appropriate public health agency and water supplier. Additional filtering and treatment of the water entering the facility's piping system can provide additional protection in these types of situations.

#### Options to help meet water needs during emergencies

- **Bottled water for drinking**—The volume of water will depend on individual needs, age, physical condition, activity level, diet, and climate. Children, nursing mothers, and ill people need more water.
- **Back-up groundwater wells**—Facilities must determine how they will comply with state regulations governing the use of such wells. Wells should be tested monthly for function and quality.
- ☐ Use non-potable water for HVAC—This can help reduce potable water use considerably. However, non-potable water could damage the HVAC equipment and result in substantial repair costs. Filtering and treatment of the water may make non-potable supplies usable in some situations.
- ☐ Label faucets Non-potable/Do not drink—Maintaining an effective operations and maintenance program for cross-connection control will help minimize the potential for contamination of potable water faucets.
- ☐ Use large containers for food prep, handwashing and other specialized needs—Sufficient storage space can sometimes present a limitation and water must be replaced regularly (FEMA recommends every 6 months). The distribution details should be addressed in the EWSP and EOP.
- ☐ Use large containers and buckets (trash cans, mop buckets, etc.) for toilet flushing—The filling and distribution of these containers should be addressed in the EWSP and EOP.

Flow charts included on the following pages are intended to assist facility managers both in initial decision-making and in evaluating each of the various response options.



#### **Overview**

See EWSP document, page 15.

## WATER RESTRICTIONS BASED ON ANTICIPATED LENGTH OF OUTAGE

Consult with the water utility, health department, hospitals in the area and other authorities about the nature of the water outage and anticipate its duration

**8 HOURS OR LESS** 

UNKNOWN OR MORE THAN 8 HOURS

## DETERMINE NEED TO LIMIT AVAILABLE WATER SUPPLIES TO CRITICAL FUNCTIONS ONLY, AS EVALUATED IN WATER USE AUDIT

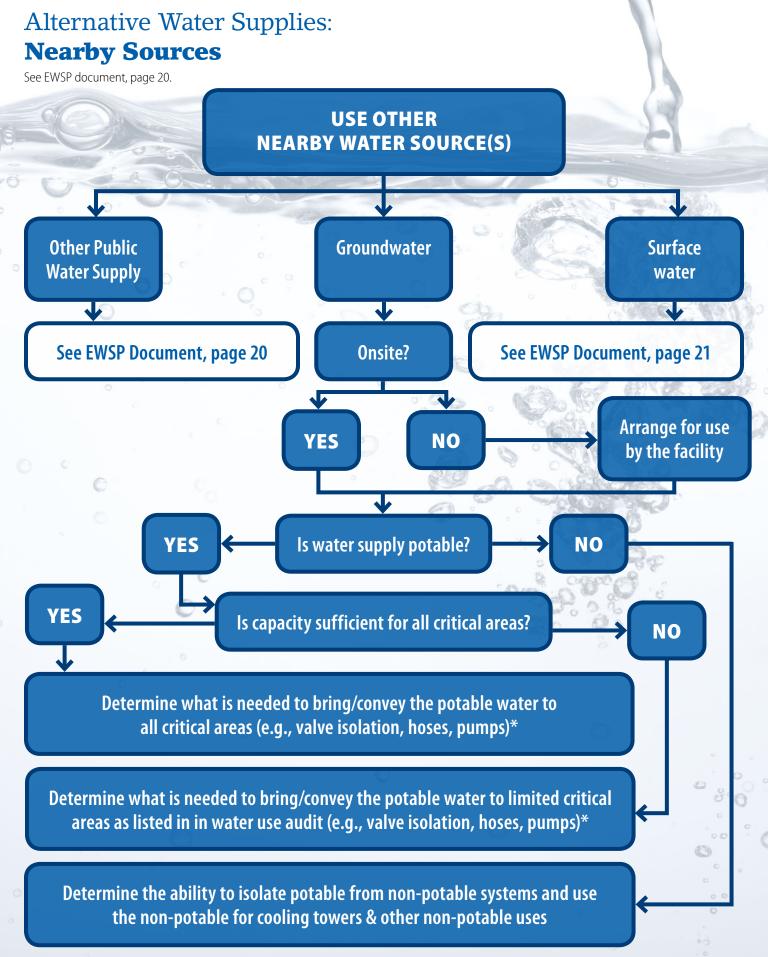
- ✓ Use bottled water for drinking
- ✓ Use large containers (e.g., 5- &10-gallon) for food prep, hand washing, and other specialized needs
- ✓ Use large containers and buckets for toilet flushing
- ✓ Use back-up groundwater well(s), if available
- ✓ Use non-potable water for HVAC, if appropriate
- ✓ Label faucets as NON-POTABLE/DO NOT DRINK
- ✓ Consider actions that may be necessary if outage continues longer than 8 hours

## ASSESS THE FEASIBILITY OF POTENTIAL ACTIONS AND ALTERNATIVE WATER SUPPLY OPTIONS

- ✓ Limit available water supplies to critical functions only
- ✓ Label faucets as NON-POTABLE/DO NOT DRINK
- ✓ Use existing and nearby storage tanks
- ✓ Use other nearby source

- ✓ Use tanker-transported water
- ✓ Use bladders or other storage units
- ✓ Use portable treatment units for nearby source, if appropriate

## Step 3: Analyze Emergency Water Supply Alternatives Alternative Water Supplies: **Storage Tanks** See EWSP document, page 17. **USE EXISTING AND NEARBY POTABLE WATER STORAGE TANKS** Is the storage tank NO YES on facility property? Contact tank owner to Does the facility determine if all or a portion of own/control the tank? tank capacity can be dedicated to health care facility YES NO Determine if water in tank is potable (May require checking with water utility) Determine what is needed to bring water to critical areas (e.g., valve isolation, hoses, pumps)\* Determine current volume of water in tank & how long it can supply water to critical areas and/or functions See EWSP Document, page 18



## Alternative Water Supplies: **Nearby Sources—Surface Water** See EWSP document, page 21. **USE OTHER NEARBY WATER SOURCE(S)\*** Surface water (e.g., lake, pond, river, creek) Is treatment available to make water supply potable? YES NO Is capacity sufficient for all critical areas? NO Determine what is needed to bring/convey water to all critical areas (e.g., valve isolation, hoses, pumps)\* Determine what is needed to bring/convey water to limited critical areas (e.g., valve isolation, hoses, pumps) \* Isolate potable from non-potable water and use non-potable water for cooling towers & other non-potable uses

## Step 3: Analyze Emergency Water Supply Alternatives Alternative Water Supplies: **Tanker-Transported Water** See EWSP document, page 25. USE **TANKER-TRANSPORTED WATER** Isolate the building plumbing [close the connection to primary water supply] Is water source potable? [may require approval by local or state drinking water authority] Are water tankers food grade and approved for NO transportation of potable water? YES Make connection to building [will likely require potable water pump, pressure bladder tank, pressure switch, pipes, and fittings]\* Isolate potable from non-potable systems and use nonpotable water for cooling towers and other non-potable uses

## Alternative Water Supplies: **Bladders and Other Storage Units** See EWSP document, pages 28-34. **USE BLADDERS AND OTHER STORAGE UNITS** Are they intended for potable or non-potable uses? See EWSP **NON-POTABLE POTABLE** Document, page 31 Confirm (e.g., with state drinking water authority) that water source used to fill storage units is potable Confirm storage units are food grade and approved for potable water use Confirm method of transporting the water to the storage units is approved for potable water\* Determine storage capacity and source capacity and identify how potable water is to be used (e.g., drinking, handwashing, pumped to limited critical areas] Determine what is needed to distribute water to identified areas\*

## **Bladders and Other Storage Units for Non-Potable Uses**

See EWSP document, page 31.

## USE BLADDERS OR OTHER STORAGE UNITS FOR NON-POTABLE USES

Identify supplier and the size and number of storage units available

Identify non-potable supply and method to transport the water to the storage units

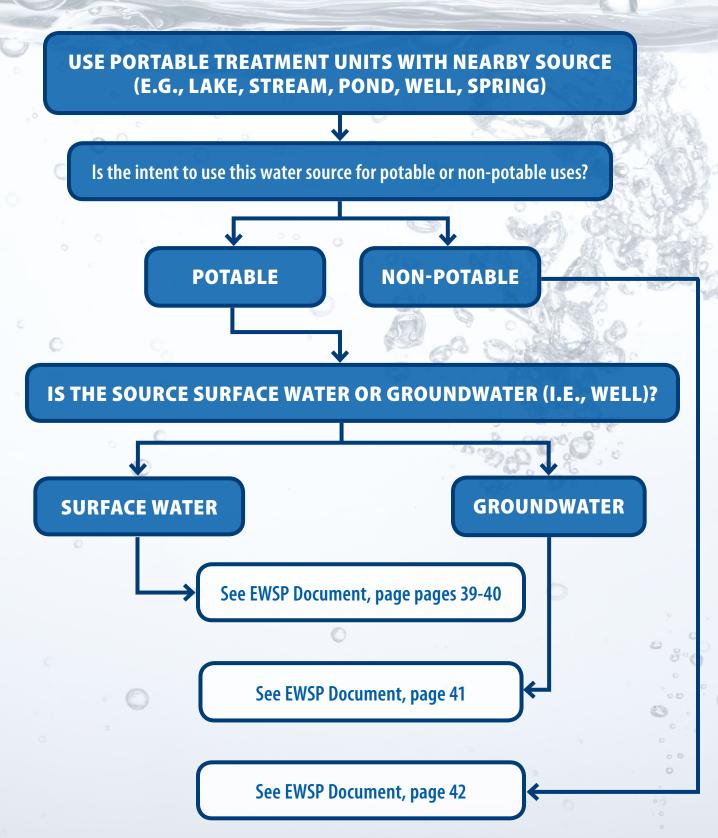
Determine storage capacity and source capacity and identify how non-potable water will be used (e.g., cooling towers, toilet flushing)

Determine what is needed and how to distribute non-potable water to identified areas

Isolate potable from non-potable systems and use non-potable water for cooling towers and other non-potable uses
[clearly identify and label as NON-POTABLE/DO NOT DRINK]

### **Portable Treatment Units-Overview**

See EWSP document, page 38.



#### **Portable Treatment Units for Surface Water Source**

See EWSP document, page 42.

## USE PORTABLE TREATMENT UNITS FOR POTABLE WATER SUPPLY THAT WILL COME FROM NEARBY SURFACE WATER SOURCE

#### **IDENTIFY ANY WATER QUALITY PARAMETERS OF CONCERN**

(e.g., arsenic, iron, VOCs) [will require consultation with state drinking water authorities]

#### **IDENTIFY TREATMENT REQUIREMENTS**

[will require consultation with state drinking water authorities]

## FILTRATION AND DISINFECTION

## DISINFECTION ONLY

#### **SELECT FILTRATION METHOD**

Cartridge filtration?
Membrane filtration?

## DETERMINE

Required and available filter treatment capacity

Confirm acceptability with state drinking water authority

Identify appropriate treatment unit(s)

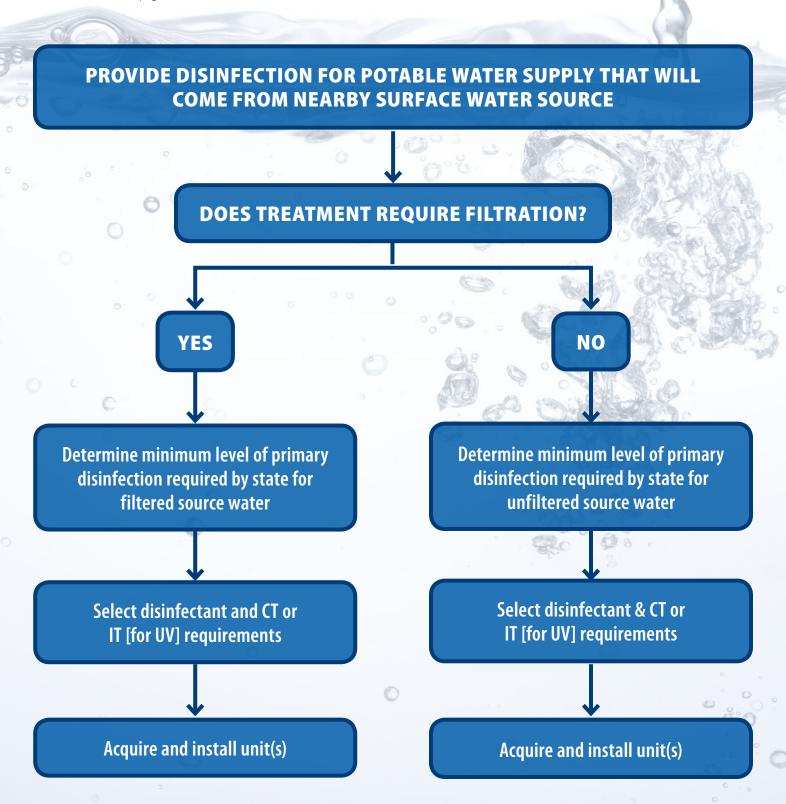
Determine what is needed to bring/convey water to critical areas (e.g., valve isolation, hoses, pumps)\*

Acquire and install unit(s)

See EWSP Document, pages 36-37

#### **Disinfection of Surface Water**

See EWSP document, pages 36-37.



#### **Portable Treatment Units For Groundwater Source**

See EWSP document, page 21.

## USE PORTABLE TREATMENT UNITS FOR POTABLE WATER SUPPLY THAT WILL COME FROM NEARBY GROUNDWATER SOURCE

## IDENTIFY ANY WATER QUALITY PARAMETERS OF CONCERN (E.G., ARSENIC, IRON, VOCs)

[will require consultation with state drinking water authorities]

### **IDENTIFY TREATMENT REQUIREMENTS (E.G., DISINFECTION)**

[will require consultation with state drinking water authorities]

Determine required and available treatment capacity

**Identify units** 

Confirm acceptability with state drinking water authority

Determine what is needed to bring/convey water to critical areas (e.g., valve isolation, hoses, pumps)\*

Acquire and install unit(s)

### **Portable Treatment Units for Nearby Water Source**

See EWSP document, page 21.

USE PORTABLE TREATMENT UNITS FOR NON-POTABLE WATER SUPPLY THAT WILL COME FROM A NEARBY WATER SOURCE

IDENTIFY THE FACILITIES OR EQUIPMENT THAT WILL BE SUPPLIED WITH THE NON-POTABLE WATER (E.G., COOLING TOWERS)

IDENTIFY ANY WATER QUALITY PARAMETERS OF CONCERN FOR THE FACILITIES OR EQUIPMENT (E.G., TURBIDITY, IRON, MANGANESE)

IDENTIFY TREATMENT REQUIRED TO ADDRESS/REMOVE THE WATER-QUALITY PARAMETERS OF CONCERN

Determine required and available treatment capacity

Identify units

亚

Will require consultation with state drinking water authority

Determine what is needed to bring water to the selected non-potable areas or equipment (e.g., valve isolation, hoses)

Isolate potable and non-potable systems & use for cooling towers and other non-potable uses

Acquire and install unit(s)

#### STEP 4

**DEVELOP** and exercise your EWSP Based on the analysis of the Water Use Audit and the availability of alternate emergency water supplies, develop a written EWSP for the facility. Exercise the plan annually and make any adjustments as needed. A "hot-wash" and after-action report should be conducted immediately after the exercise.

Revise the plan as needed after each exercise. Other reasons to consider revising the emergency water supply plan include a significant facility expansion or modification, or to incorporate the lessons learned following a response to an actual water supply interruption.

In the EWSP Guide, Appendices A, B, C, D, E, and F include case studies, an example plan, a loss of water scenario, water use audit forms, information about portable water flow meters, and information for dialysis centers to help with planning considerations.

