USACHPPM
Readiness thru Health
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Just the Facts...

Countering Terrorism of Drinking Water Supplies

Drinking water supply systems, especially treatment and distribution/storage facilities, may present targets of opportunity for physical destruction, intentional contamination, or cyber attack by terrorists.

Measures to counter terrorism of drinking water supplies embrace:

- ***Preparedness***
  - Having an emergency response plan. Addressed elements should include:
    - An emergency operations center.
    - A listing of all key personnel with telephone numbers. External personnel should include subject matter experts and representatives from various public health agencies, such as the Centers for Disease Control and Prevention, local medical authorities, law enforcement officials including the FBI, emergency responders and management officials, sources for critical equipment and supplies, and the local media for public notification. An important number to include is the National Response Center Hotline at 1-800-424-8802.
    - Plans or procedures for documenting any threat calls.
    - A current water system facilities map.
    - A listing of qualified laboratories with analytical capabilities. Agent detection laboratories, while limited, exist.
    - Alternative water approaches –e.g., boiling, bottled supplies, temporary special treatment equipment, and hauled-in supplies.
  - Assessing the vulnerability of the water system. Identifying critical components subject to easy destruction or points where contaminants can be easily introduced (e.g., remote storage facilities), and prioritizing them for security improvements.
  - Enhancing security by elimination of unauthorized access to critical facilities, ensuring physical protection, and increasing patrols.
  - Impressing waterworks personnel with the importance of noting and reporting abnormal conditions when performing routine duties.
  - Enhancing monitoring. During times of increased threat, measurement of routine parameters such as pH, turbidity, conductivity, and chlorine residual (location, frequency) should be expanded; on-line measurements along with alarm capability are considerations. An unexplained drop of chlorine residual could indicate contamination by a crude agent preparation. Specialized analyses (e.g., for chemical agents) may be warranted. Consumer complaints concerning discoloration, unusual taste, or objectionable odor may provide early warning, as well as an increase in illnesses at emergency medical care facilities. Continuous monitoring of water pressure has value in evaluating the potential for contamination by cross-connections.
  - Protecting any automated equipment and system control and data acquisition (SCADA) systems from cyber attack.
- ***Response.*** Actions must first protect consumers and then address/resolve the terroristic problem. Appropriate notifications must be made, safe emergency water supplies be made available, necessary expert assistance be obtained, relevant system-specific combative actions such as isolative measures or increased disinfection practices and restorative measures taken. Terroristic acts may be preceded by threats. The effectiveness of counter terrorism responses depends on the care with which the emergency plan has been prepared. The credo of "detection, delay, and response" has great applicability (reference 1).

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References for excellent additional information include:

1. Denileon, Gay Porter, “The Who, What, Why, and How of Counterterrorism Issues”, Journal American Water Works Association, Vol. 93, No. 5, pp. 78-85, May 2001. An Executive Summary is provided online at the American Water Works Association website at: http://www.awwa.org/journal/j501es3.htm.

2. Burrows, W.D. and Renner, Sara E., “Biological Warfare Agents as Threats to Potable Water”, Environmental Health Perspectives, Journal of the National Institute of Environmental Health Sciences, C&BW, December 1999, http://ehpnet1.niehs.nih.gov/docs/1999/107p975-984burrows/abstract.html for access.

3. USACHPPM website, http://chppm-www.apgea.army.mil/ for emergency plan guidance and biological threat paper.

4. Burrows, W.D., et.al., "Natural and Terrorist Threats to Drinking Water Supplies", 23rd American Defense Preparedness Association 23rd Environmental Symposium, 1997. Contact water.supply@apg.amedd.army.mil to request the document.

5. Foran, J.A. and Brosnan, T.M., "Early Water Monitoring to Detect Hazardous Events in Water Supplies", Environmental Health Perspectives, Journal of the National Institute of Environmental Health Sciences, C&BW, October 2000, at http://ehpnet1.niehs.nih.gov/docs/2000/108p993-995foran/foran-full.html.

6. Brosnan, T.M., "Early Warning Systems for Hazardous Biological Agents in Potable Water", Institute of Life Sciences Workshop Report, December 1999, at http://www.ilsi.org/publications/pubslist.cfm?pubentityid=13&publicationid=268.

7. Haimes, Y.Y., et.al., "Reducing Vulnerability of Water Supply Systems to Attack", Vol. 4/No. 4, December 1998, Journal of Infrastructure Systems, American Society of Civil Engineers, ISSN 1076-0342/98/0004-0164-0177, Paper No. 16607.

8. USEPA information at http://www.epa.gov/swercepp/cntr-ter.html.

9. Information from the Center for Disease Control and Surveillance at http://www.bt.cdc.gov.