



BILL RICHARDSON
Governor

State of New Mexico
ENVIRONMENT DEPARTMENT
Environmental Health Division

Drinking Water Bureau
5500 San Antonio Dr. NE
Albuquerque, New Mexico 87109
Telephone (505) 222-9534
Fax (505) 222-9510



RON CURRY
Secretary

DERRITH WATCHMAN-MOORE
Deputy Secretary

ANA MARIE ORTIZ
Director

Outreach Document – Small Community Water System Security
Issues

Introduction

This is an introductory letter to provide information regarding water system security and emergency response for small community water systems. For the past 3 years, the Drinking water Bureau (DWB) security team has been working with larger water systems that serve >3300 people. These systems have created vulnerability assessments (VAs) and emergency response plans (ERPs). Many of these systems have made security upgrades including: fencing, lighting, installation of SCADA systems, storage tank entrance alarms, camera systems, neighborhood watch programs, etc. Some have received available, federal grant funding for security upgrades. A few systems have also practiced their emergency response plans in tabletop exercises and drills.

Now NMED is beginning a water system security outreach program to community water systems serving <3301 people and non-transient, non-community water systems. There are no requirements for these systems and the ideas and concepts presented here are only recommendations and suggestions. However, water system security is a big issue, and drinking water/wastewater systems are considered to be one of the seven main designated "Critical Infrastructures" under the Homeland Security Act and subsequent acts. This means that these utilities are essential to the well being of the nation and that these types of facilities are attractive targets for both foreign and domestic terrorists.

In fact, in NM there has been a steady stream of incidents/intrusions at water systems over the past 3 years. These incidents include: intrusions into large storage tanks (3,000,000-gals. and less) by both armed and unarmed persons, potential water contamination incidents, stolen vehicles and other equipment, tank shootings, equipment destruction, including SCADA facilities, valve turning incidents, etc. These kinds of activities plus other suspicious activities like surveillance, informational interviews, and photographing incidents are being reported from water utilities nationwide.

Based on national security protocols and these kinds of malevolent activities, EPA and NMED are trying to build water system awareness of security issues. Now that large and medium sized community water systems (CWSs) are in the security loop, it is time to begin creating this awareness in smaller systems. There are many steps that water systems can take that will improve water system security and build a system's capability to respond to emergency situations. Many of these solutions are inexpensive and very cost effective. Suggested water system activities include the following. Please consider implementing some/all of these recommended security activities.

Vulnerability Assessments (VAs)

Building water system security begins with the preparation of a VA. This study identifies the most vulnerable areas of the water system, such as single points of failure, unprotected, or easily attacked facilities, which if attacked could cause great harm, etc. The VA will also suggest ways to reduce risk and create a more secure water system.

The 6 basic elements of a vulnerability assessment are:

1. Characterization of the water system, including its mission and objectives;
2. Identification and prioritization of adverse consequences to avoid;
3. Determination of critical assets that might be subject to malevolent acts that could result in undesired consequences;
4. Assessment of the likelihood (qualitative probability) of such malevolent acts from adversaries (e.g. terrorists, vandals, disgruntled employees);
5. Evaluation of existing countermeasures; and
6. Analysis of current risk and development of a prioritized plan for risk reduction.

NMED suggests that small community and non-transient, non-community water systems use existing software to create a VA. The Rural Community Assistance Corporation (RCAC) has a CD and the NM Rural Water Association (NMRWA) has the SEMS software CD (Security and Environmental Management System). These programs are similar and they both produce a VA that is approved by EPA. Both of the CDs are free and can be obtained by calling NMRWA at (505) 884-1031 or by calling RCAC at (505) 298-4511. These CDs are very user friendly, and their greatest feature is that both a VA and an emergency response plan (ERP) can be created together. Assistance in preparation of a VA or ERP using these tools is available from NMED/DWB, RCAC, or NMRWA.

If a water system wants to create a more sophisticated or valuable VA, NMED/DWB can assist. The ASSET software by the New England Water Works Association was used by many NM CWSs serving >3300. A DWB District Security Coordinator will be able to train systems on this software or assist in the preparation of a VA. For those systems that want a real challenge and a very good VA, the VSAT software is available from the Association of Metropolitan Sewerage Agencies at: www.vsatusers.net. NMED will not be able to assist with this software.

FYI, the Rural Utility Service (RUS) is now requiring water systems that apply for loan or grant funding to complete a VA and an ERP, before they will approve the loan/grant.

Once completed, VAs should be considered to be sensitive/confidential documents because they are essentially a roadmap to how to effectively attack the water system. A water system should keep 2 copies of the VA, locked up in 2 separate locations. The VA should not be kept on a computer hard drive, but it is OK to load it onto a CD, disk, etc. and keep the CD locked up.

Emergency Response Plans (ERPs)

After the vulnerability assessment is completed, it is time to tackle the ERP. This document includes a lot of different information, but its main purpose is as a plan that outlines actions to take in an emergency. The 8 core elements of an ERP are:

1. System specific information – Basic information, including distribution plans, process flow, as-built drawings, operational procedures, etc.
2. CWS Roles and Responsibilities – Water system emergency command structure
3. Communication procedures – Internal and external notification lists, media procedures
4. Personnel safety – Evacuation plans, safety procedures, training, emergency equipment, first aid, etc.
5. Identification of alternate water sources – mutual aid agreements, planning, etc.

6. Replacement Equipment and Chemical Supplies – inventory of available equipment, spare parts, mutual aid agreements, sources of replacement equipment, etc.
7. Property Protection – “Lock down” procedures, evidence protection, establishment of a security perimeter, etc.
8. Water sampling and Monitoring

The key features of an ERP are “Action Plans” created for specific incidents, ie potential water contamination in a distribution main or storage tank, loss of a well(s), loss of a pump station or transmission main, SCADA intrusion, loss of electricity, etc. Each plan should be for a specific facility and a specific scenario. The more action plans you have, the more prepared you will be. At a minimum, action plans should be written for scenarios for attacks against the main vulnerabilities identified in the VA.

Both RCAC’s CD and the NMRWA SEMS software include development of an ERP. The EPA also has an excellent template for creating an ERP from scratch called: “Emergency Response Plan Guidance for Small and Medium Community Water Systems to Comply with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002”. This guidance is easy to follow and produces an excellent ERP. It can be downloaded or printed from EPA’s website: www.epa.gov/safewater/security.

Once an ERP is created, it must be updated regularly. Contact names and information, phone numbers, e-mail addresses, etc. change frequently and if the ERP is not updated at least annually (or more often), it will become useless. Also, water system personnel must be trained on the ERP so people will know what their duties are prior to the emergency. This training also includes practicing and using the ERP in tabletop exercises, full scale drills, etc. Setting up some kind of emergency scenario and having system personnel run through what they would do is an excellent method of getting your personnel familiar with the ERP. Tabletop exercises also reveal how well the ERP works. After the exercise, the whole group should go through a debriefing to determine what went right and what went wrong. This information should be used to improve both the ERP and the water system personnel’s response.

EPA’s “Drinking Water Security for Small Systems Serving 3,300 or Fewer Persons

This document can be printed from EPA’s website: www.epa.gov/safewater/security. Click on “Publications”. Click on “Guidance”. Scroll down to “Drinking Water security for Small Systems Serving 3,300 or Fewer Persons”.

This document is an excellent security guidance for small water systems. It is written in simple terms strictly for small systems that have limited personnel and financial resources. The 6-step VA guidance will help you understand the VA process as you use one of the VA tools already mentioned. There are many things to consider when assessing vulnerabilities and forming a plan to reduce risk. The 6-step process will help you understand what these are.

Following the 6-step VA process is a section on making security upgrades and improvements. This includes many simple steps the system can take immediately, many of which are very cost effective and inexpensive. Other more expensive upgrades, such as installation of SCADA/telemetry control systems, entry alarms, motion detectors, camera systems, purchase of back-up generators (alternate power sources) etc. can be funded over time.

The next section is on emergency response plans (ERPs), which is a critical aspect of security. This section contains a 5-step process (similar to the 6-step VA process) that will help you understand water system emergency response as you use one of the ERP tools already described. Again, there are many things to consider when planning for emergencies and this guidance will help you understand them as you prepare your ERPs. **Remember that the most important part of an ERP are the**

specific action plans prepared for scenarios that could happen at your facilities. The more of these that you include, the better your ERP will be.

Following the ERP section are sections on maintaining security in the long run, communicating with your customers and where you can find additional help.

NMED/DWB Security Points of Emphasis

These considerations are things that NMED feels are important in NM, that are easy and inexpensive (mostly) to implement and that will make a difference in the future.

1. Establishment of neighborhood watch programs specifically geared for protecting the drinking water system.
 - A. Posting of warning/No Trespassing signs at facilities that have a phone number to call if suspicious behavior is observed;
 - B. Posting of informational security posters that are available free from EPA around the system. Ordering instructions for this information is available on EPA's website: www.epa.gov/safewater/security, under "publications".
 - C. Letter writing and training to customers who live near critical facilities such as: sources, transmission mains, treatment facilities, storage tanks, booster pump stations, etc. These letters should make the customer aware of their proximity to one of these facilities and the importance of reporting suspicious behavior, water system tampering, loitering, etc. to the water system. The letter should also request the assistance of the homeowner in this very important observation and information reporting task.
 - D. Involving your community in security programs like this will definitely help your water system improve its security.
2. Establishment of a working relationship with local law enforcement.
 - A. Drinking water and wastewater systems are one of the 7 major, national "Critical Infrastructures" under the Homeland Security Act and subsequent laws. Law enforcement is mandated to protect these kinds of facilities, so it is important that they become aware of the presence of water systems in their jurisdiction.
 - B. Give tours or maps of your facilities to police and sheriff's departments, so they will know how to find a particular location in case of an emergency.
 - C. Local law enforcement should conduct random patrols of the water system facilities in addition to water system inspections of their own facilities.
3. Mutual Aid Agreements – These agreements are created between water systems for the mutual benefit of both during an emergency.
 - A. Describes how the water systems contact each other during an emergency and what information about damages, etc. needs to be transmitted from the damaged utility to the assisting utility and vice versa. Also includes other details that need to be understood by participating utilities.
 - B. Sets out what elements, personnel, equipment, spare parts, etc. each system is able and willing to provide during an emergency;
 - C. Items that are much in demand during an emergency include: bulk water, portable back up generators, pumps, chlorination equipment, back hoes and other digging equipment, spare parts, communications equipment, etc.
 - D. The parties to the agreement agree to assist the other(s) to the extent possible.
 - E. The agreements also may address other issues such as: reimbursable expenses, insurance issues and arbitration.
 - F. Water systems can organize these mutual aid agreements so they benefit multiple water systems or a group of systems.

- G. NMED/DWB can assist water systems in the creation of mutual aid agreements.
4. Protection of storage tanks and Prevention of Potential Contamination Incidents
 - A. Large storage tanks are generally, easily spotted facilities that are attractive targets for vandalism and terrorist activities.
 - B. There has been a rash of intrusion incidents at storage tank compounds in NM over the last 3 years. When a storage tank breach occurs, it opens up the possibility that anything under the sun could have been dumped inside.
 - C. A potential contamination incident is the worst and one of the most expensive incidents that a water system will ever face. Because it is unknown if something was dumped or what may have been brought into the facility, an in-depth investigation called "Site Characterization" must be conducted to prevent injury and poisoning of investigating personnel. Many potential contaminants may have to be sampled for under high priority laboratory protocols that are extremely expensive. These costs will probably be borne by the water system, since NMED's Water Conservation Fund is only designed to pay for "routine" required chemical and biological samples.
 - D. One of the best ways to prevent/mitigate storage tank intrusions, if a system has a telemetry, SCADA or phone line control system, is the installation of entrance alarms on tank bulkheads and access hatches. These alarms, if wired to a dialer or other communication system will immediately alert system personnel of an intrusion.
 - E. If a system is alerted immediately, steps can be taken that will prevent potentially contaminated water from entering the distribution system.
 - F. NMED recommends long range planning for funding of SCADA, telemetry system installation and hook-up of inexpensive entrance alarms.
 - G. There are also other water system facilities where contamination can be dumped or pumped into the system, such as wells, surface water sources, distribution sources like fire hydrants and homes. However, these sites are not as easily identified as a large storage tank. Well sites can be outfitted with entrance alarms, fire hydrants can be hardened and homes can be isolated from the system by back-flow prevention devices.
 5. Notes about the purchase and installation of camera detection systems
 - A. If purchase of a camera detection system is implemented, the film footage should not be monitored by humans. We are by nature unfocused and unable to monitor something continuously while maintaining an adequate level of concentration. Hollywood movies love security persons watching TV monitors, but this does not work in the real world.
 - B. Now, there is software available that can be installed in the cameras that continuously scans the image for motion. If motion is detected, the software is wired to a dialer that alerts security personnel, etc. This allows for verification of the incident prior to notification of local law enforcement. Many things like cats, other animals, windblown branches or blowing trash can trigger motion detectors.
 - C. Police will not continue to respond to water system emergency calls if calls turn out to be mistakes or false alarms.

NMED/DWB Outreach Activities and possible future programs

1. The emergency test kit distribution program
 - A. NMED/DWB received a grant from the NM Department of Health to purchase emergency response test kits.
 - B. These test kits are being distributed statewide to interested and deserving community water systems.
 - C. The components of a kit test for: radiation (alpha, beta, gamma and X-rays), cyanide, pH, conductivity and chlorine residual. These parameters and contaminants are important indicators of whether or not something was dumped or pumped into a drinking water system.

- D. The test kits are an important first responder tool in any kind of “potential contamination incident”. A “potential contamination incident” is defined as any security breach, where something could have been pumped or dumped into a public water system (PWS). Examples include: the opening or cutting of a lock on a storage tank access hatch, the opening of the top of a wellhead, dumping of contaminants into surface water, tampering with a fire hydrant or other flush hydrant on the system, pumps or hoses left at a fire hydrant or in a vacant home or garage.
 - E. The radiation meter, and the other 4 tests play an important role in “site characterization”. Site Characterization is a step process where investigators (security breach, intrusion, etc.) determine if hazardous substances may have been brought into the site and if it is safe to enter the site or continue the investigation/damage assessment.
 - F. It is envisioned that CWSs that have one of these kits will share the kit during an emergency at a nearby water system. A water system operator that has one of these kits has agreed to assist other systems if possible. These operators can probably test for the contaminants themselves, since they have already been trained in the test kits use.
 - G. Once the test kit distribution is complete, a list of all CWSs with contact name, phone number and e-mail address (if available) will be sent to all CWSs and NTNCs in NM.
 - H. If your system is interested in obtaining a test kit, please call your NMED/DWB oversight person. There may still be some left.
2. DWB’s Emergency Response Plan for Responding to Drinking Water System Emergencies
- A. This document has been created but has not been finalized yet.
 - B. It will be a plan that will coordinate water system actions with actions by NMED and other emergency response partners in NM and federally.
 - C. It is designed to set out chronological actions to be taken by DWB District Security Coordinators, DWB oversight staff and water system personnel during any drinking water emergency.
 - D. A key feature of this plan is that it helps the DWB assist the water system in responding to the incident and hopefully limit negative outcomes from the emergency. If a water system does not have its own emergency response plan, the DWB will be able to use this plan to help the system respond.
 - E. When this plan is finalized, it will be sent to all CWSs and NTNC in the state. Water systems should keep this document with their own ERP.
 - F. This plan will be a living document and may be updated/changed in the future.
3. NMED’s Emergency Communication Protocol
- A. This document is the single most important document in the DWB’s Emergency Response Plan. It is found in Appendix “A” of the ERP.
 - B. It sets out 3 and possibly 4 phone calls that a water system must make as quickly as possible after notification of a security breach, intrusion incident, malevolent act, natural disaster or accident.
 - C. As soon as possible, fill out the required information on the communication protocol form. This information will be given to the recipients of the 3 (4) phone calls. **Do Not Delay This Call While You Look For latitude/longitude Information. This info. can be submitted later.**
 - D. As soon as the form has been filled out, call your local law enforcement ([911](#), local police, sheriff, state police, etc.). The second phone call is to the NM Emergency Operations Center (NMEOC). The third call is to your local DWB office (oversight staff or office supervisor). If there is evidence of terrorism (yellow, protective radiation suits, pumps or hoses, bomb or IED, etc.) call the FBI in Albuquerque or Las Cruces.
 - E. The NMEOC will immediately call the 7 agencies which are emergency response partners in NM and federally. These include: 1) NMED/Hazardous Waste Emergency Response Team, 2) NM Department of Health (NMDOH), 3) NM State Police, 4) FBI, 5) NM Governor’s Office of Homeland Security, 6) the county emergency manager in the affected county and 7) the EPA Region 6 Emergency Response Team in Dallas.

- F. This emergency response protocol should be activated during **any drinking water system emergency, act of vandalism, terrorism, etc.**, with the exception that graffiti incidents do not have to be reported if the system is sure that the incident was, in fact, solely graffiti related.
4. Develop e-mail capability between the DWB and all NM CWSs that have e-mail
 - A. This will allow NMED to alert water systems immediately if there is a change in the national threat alert level or if there is special threat assessmsnt that affects NM or NM Drinking water systems. Presently the alert level is yellow (Elevated) – Significant risk of terrorist attack.
 - B. Route for delivery of other security related information such as training opportunities, useful resources, etc.
 5. Creation of a training template for Protection of Evidence during a malevolent event investigation.
 - A. This will be for water systems to use in training their own personnel.
 - B. Protection of evidence is a very important issue during “Site Characterization” and initial investigation of a security breach, etc.
 - C. Police don’t respond well when there is no evidence to process or evidence has been compromised.
 - D. Mostly awareness issues
 6. Development of a law enforcement “Drinking Water System Awareness Training” that will probably be delivered by the NM Public safety Department (NM Emergency Operation Center [NMEOC] to law enforcement offices statewide.
 7. NMED/DWB pursuit of funding for:
 - A. An Emergency Water Sampling Fund for standard lab analytical costs during a potential contamination incident,
 - B. The purchase of enhanced rapid field screening test kits. These test kits will be capable of screening for weapons of mass destruction, biological pathogens, industrial chemicals, heavy metals, etc. Ideally, NMED would have 2 of these sets of test kits, one in northern NM and one in the south that could be used anywhere in the state within 4 hours.

NMED/DWB Security Staff

- Darren Padilla – Coordinator, Santa Fe Office, (505) 476-8631, darren.padilla@state.nm.us
- Jerome Lewis – District I Security Coordinator, Albuquerque Office, (505) 222-9534, jerome.lewis@state.nm.us
- Jan Dye - District II Security Coordinator, Raton Office, (505) 445-3621, jan.dye@state.nm.us
- Ernest Valenzuela – District III Security Coordinator, Las Cruces Office (505) 647-7958, ernest.valenzuela@state.nm.us
- John Pijawka – District IV Security Coordinator, Ruidoso Office (505) 258-3272, john.pijawka@state.nm.us

This document can also be found on the NMED Drinking Water Bureau website under “Security”.