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INDEPENDENT STATE AUDITOR'S REPORT ON CERTAIN ACTIVITIES OF THE MASSACHUSETTS WATER RESOURCES AUTHORITY'S EMERGENCY MANAGEMENT PLAN JUNE 1, 2002 THROUGH DECEMBER 31, 2004

OFFICIAL AUDIT REPORT

JUNE 8, 2005

INTRODUCTION

The Massachusetts Water Resources Authority (MWRA) was established by Chapter 372 of the Acts of 1984 to assume the duties and responsibilities of the Metropolitan District Commission's Water and Sewer Division. These responsibilities include providing wholesale water and sewer services to 61 communities and approximately 2.5 million people in the Commonwealth. MWRA is an independent authority and funds its operations primarily through user assessments and charges. MWRA's mission is to provide reliable, cost-effective, and high-quality water and sewer services that protect public health, promote environmental stewardship, maintain customer confidence, and support a prosperous economy.

MWRA maintains 400 miles of water pipes, aqueducts, and tunnels, and 240 miles of sewers. MWRA's service area covers approximately 410 square miles and includes approximately 850,000 homes and 6,000 businesses, which collectively produce about 340 million gallons of sewage each day. MWRA supplies drinking water to approximately 2.2 million people in 47 communities. Daily water usage averages 250 million gallons. MWRA's water originates in western and central Massachusetts in the Quabbin Reservoir, Ware River, and Wachusett Reservoir watersheds. MWRA has large water reservoirs in relation to its withdrawals. Quabbin Reservoir has a capacity of 412 billion gallons, and Wachusett Reservoir holds 65 billion gallons. When full, the reservoirs hold over four years' worth of water demand for MWRA users, to protect them from droughts.

The objective of our audit was to review the status of the MWRA's efforts to identify and mitigate drinking water and wastewater security risks in order to protect the Authority's considerable assets and the people who use these resources daily.

In accordance with Generally Accepted Government Auditing Standards, certain information gathered in this report has been prohibited from general disclosure for security reasons, including specific facility locations and the physical security enhancements made or planned. Such sensitive information is being provided in a separate audit report (No. 2004-1323-3C) only to cognizant officials for their consideration and action.

AUDIT RESULTS

The Office of the State Auditor has completed a review of MWRA's Security Management Program for the period June 1, 2002 through December 31, 2004. The review found that MWRA has made significant security improvements to date and that additional planned enhancements would have a beneficial effect on MWRA's effort to protect its drinking water and sewage assets.

On June 12, 2002, President Bush signed into law Public Law (PL) 107-188: the Public Health Security and Bioterrorism Preparedness and Response Act of 2002. This Act amends the Safe Drinking Water Act by adding Section 1433, which requires that certain community water systems (CWSs) conduct a vulnerability assessment (VA), certify to the Environmental Protection Agency (EPA) that the VAs were conducted, and submit a copy of the VA to the EPA. Section 1433 also requires that certain CWSs prepare or revise emergency response plans (ERPs) and certify to the EPA that an ERP has been completed. The Act required that MWRA submit its VA of the waterworks system by March 31, 2003, and we found that MWRA fulfilled this requirement. In addition, on September 30, 2003, MWRA certified that it had updated its ERPs to address the risks identified in the VA and, specifically, the threat of aggressive terrorist action against MWRA's water facilities and operations. In the course of preparing the VA and ERP, MWRA hired several consultants who are security experts to assist it in the preparation of the documents. MWRA engaged Sandia National Laboratories (SNL) to design its VA as required by PL 107-188. MWRA followed SNL's VA methodology and, using its own trained staff, developed a number of emergency action plans that were included in the ERP to address contamination and destruction threats to MWRA's water facilities.

According to MWRA, the most important element of MWRA's long-term security strategy is its $1.7 billion Integrated Water Supply Improvement Program (IWSIP). Begun in 1996, this capital improvement program for water treatment, storage, and distribution is the most effective security improvement undertaken by MWRA. The backbone of the program is the new 17.6 mile Metro-West Tunnel, which provides greatly needed redundancy for water transmission. Because it lies hundreds of feet below ground, it offers protection against physical attacks involving explosives or contaminants. Also, five relatively new covered water-storage facilities greatly reduce the vulnerability of open storage reservoirs to contamination by being placed

underground with controlled access. Moreover, water pipeline projects are providing both system redundancy and emergency-response capabilities to address biological and physical attacks. According to MWRA, progress continues on the projects that make up the IWSIP, and when all major elements are completed in 2005, numerous security concerns will have been addressed.

MWRA has also "hardened" and improved security by adding card access to its most vulnerable buildings, installing intrusion devices at key locations that are monitored by control centers, adding additional fencing, locking facilities, placing jersey barriers to prevent motor vehicle access, and utilizing security guards.

Moreover, MWRA has installed computer systems that control the operations of the water system facilities, monitors alarms, and provides operators with the ability to take remote control of a facility, if necessary. Some of the benefits include tighter control of water system operations, immediate notification of trouble conditions, and the collection of water system data for management decisions. These systems include hydraulic alarms that give an immediate indication of a breach of the pressurized system as might occur during an explosives attack. Process alarms are also present in the chemical feed system and monitor the performance of both the feed equipment and the resulting concentration level, loss of communications, power failure, etc. MWRA also maintains contact with the Massachusetts State Police for all of its facilities, and with the Department of Conservation and Recreation (DCR) (formerly MDC) at reservoirs and public parkland locations. Although not yet federally mandated, MWRA has also made significant security improvement at its wastewater facilities at Deer Island and other locations.

Because a cultural shift was needed at MWRA in order for security to become an integral part of its operation, MWRA instituted a comprehensive staff-training program and has implemented a number of drills and exercises. Moreover, MWRA has accomplished the above enhancements mainly with their own funds. According to MWRA, only $365,000 has been awarded by the State Homeland Security Program through December 2004.

Although much has been accomplished to date, we recommend that the MWRA continue (1) implementing the additional enhancements needed to protect its drinking water and wastewater

facilities, (2) improving communications with DCR and the State Police, and (3) updating its ERP.

At the conclusion of the review, we provided the MWRA's Executive Director with a draft of the report for comment. The Executive Director agreed with the recommendations and supplied specific comments for each finding.