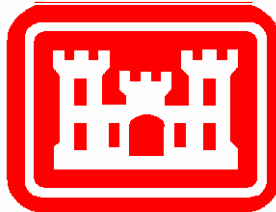


PUBLIC WORKS TECHNICAL BULLETIN 200-1-46
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**WATER CONSERVATION AND WATER
EFFICIENCY GUIDANCE**



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Facilities Engineering
Environmental

WATER CONSERVATION AND WATER
EFFICIENCY GUIDANCE

1. Purpose.

a. This Public Works Technical Bulletin (PWTB) transmits information on accessing the water conservation and water efficiency portion of the Army's sustainability program website. The water conservation information is not restricted to sustainability, however. Presented at the following Internet address: <https://eko.usace.army.mil/fa/water/>, the website features current Army and federal guidance documents and links to other information sources. Information is available to assist installations in meeting the requirements of producing and implementing a water management plan. The site also enables sharing of information from lessons-learned within the Army community for determining and characterizing water consumption at facilities.

b. All PWTBs are available electronically (in Adobe® Acrobat® portable document format [PDF]) through the World Wide Web (WWW) at the National Institute of Building Sciences' Whole Building Design Guide web page, which is accessible through URL:

http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215

2. Applicability. This PWTB applies to all U.S. Army facilities engineering activities within the United States.

3. References.

- a. Energy Policy Acts of 1992 and 2005.
- b. Department of Defense (DoD) Instruction 4170.11, Installation Energy Management, 22 November 2005.
- c. Army Regulation (AR) 11-27, Army Energy Program, 3 February 1997.
- d. Executive Order 13123. Greening the Government through Efficient Energy Management, June 8, 1999.

4. Discussion.

a. In 1992 the Energy Policy Act added water conservation to the Federal government's ongoing energy management efforts. The Act requires that Federal agencies implement all energy and water conservation measures with life-cycle cost paybacks of less than 10 years. In response to Executive Order 13123, which mandated the establishment of water conservation goals for all Federal agencies, the Department of Energy released guidance to establish Water Efficiency Improvement Goals for Federal agencies. The Army Chief of Staff for Installation Management released guidance directing implementation of this water efficiency goal for the Army.

b. The water efficiency improvement goal is based on each Army installation's implementation of water efficiency Best Management Practices (BMPs) and development of water management plan. It is not based on mandated percent reduction in water usage. The goal was to have 100 percent of all installations incorporate water management plans in their Installation Utility management plan by October 2004 and have a percentage of installations implement a minimum of four of the ten BMPs by the dates shown: 2004 15%, 2006 30%, 2008 50%, and 2010 80%. These ten BMPs are:

- Public Information and Education Program
- Distribution System Audits, Leak Detection, and Repair
- Water Efficient Landscaping
- Toilets and Urinals
- Faucets and Showerheads
- Boiler/Stream Systems
- Single-pass Cooling Systems
- Cooling Tower Systems
- Miscellaneous Water-using Processes

- Water Reuse and Recycling

BMPS can be considered implemented at an installation when all the following criteria have been met:

- Water Management Plans have been developed/revised and incorporated into existing facility planning processes and operating plans
- applicable operations and maintenance options have been put into practice and
- retrofit/replacement options have been reviewed within the last 2 years, those appropriate for implementation have been identified, and applicable cost-effective retrofit/replacement options have been implemented.

c. A successful water management program starts with development of a comprehensive water management plan. This plan should provide clear information about how an installation uses its water, from the time it is piped onto the installation or produced through its ultimate disposal. This information about use and costs will enable the most appropriate water management decisions to be made. Army regulations also require establishment of a water conservation plan and water resource management plan that can fit in with the overall water management plan.

d. Water consumptive activities at military installations historically have not been well-quantified due to the lack of comprehensive metering. However, the Energy Policy Acts require metering for new construction. The Pentagon website <http://army-energy.hqda.pentagon.mil/programs/plan.asp> has additional information on utility metering in the Army Energy and Water Campaign Plan for Installations. Model approaches for determining consumption are among the material presented in the website. Most installations are not comprehensively metered, which is the most exact method to determine consumption of individual activities. As the cost may be considerable to comprehensively install meters, a selective metering approach may be able to provide appropriate information.

e. More depth is presented on the various BMPs on the website. For example, under the Distribution System Audits, Leak Detection and Repair category, a well-implemented program can help installations reduce water losses and make better use of limited water resources. Reducing water losses will not only reduce operating costs, but will also help extend existing supplies to meet increasing demand that in turn could defer construction of new water facilities such as wells, reservoirs, or treatment plants. Repairing leaks will save money by reducing

power costs to deliver water and reducing chemicals for treatment. Other benefits include increased knowledge of the distribution system and reduced property damage. The first step is to complete a prescreening system audit to determine if a full-scale system audit is needed. This should be done every 2 years. If an installation has not had a full-scale distribution system audit, one should be performed until the system is found to be acceptable. A previous standard for acceptability in many states (for example, California) was under 10% "unaccounted for" water. A current recommendation in the water industry is to switch to a new comprehensive water loss management approach.

f. Knowledge of where and how water is used beneficially can help protect a Federal water right and prevent an installation from losing that water right (which is now being threatened in some states). In addition to the Army requirement, water efficiency and knowledge of consumption is also becoming a water withdrawal permit condition for both groundwater and surface water, and states may mandate metering as part of a permit.

g. Links with other agencies such as the U.S. Environmental Protection Agency and other military agencies provide additional support and guidance related to water conservation.

h. A comprehensive water management and water conservation program will save tens of millions of gallons of water and hundreds of thousands of dollars at individual installations per year, while protecting a valuable resource and reaffirming the Army's commitment to sustainability and wise stewardship. This type of management is especially important now as many installations privatize their water and wastewater utilities with accompanying higher levels of annual recurring costs. The website presents generally applicable Army and Federal guidance, examples, and a template for a water management plan, model approaches to determine water consumption of activities, examples and explanations of BMPs, and links with other agencies.

5. Points of Contact. HQUSACE is the proponent for this document. The POC at HQUSACE is Mr. Malcolm E. McLeod, CEMP-II, 202-761-0632, or e-mail: Malcolm.E.Mcleod@hq02.usace.army.mil.

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FOR THE COMMANDER:

A handwritten signature in black ink, appearing to read 'M.K. Miles', written in a cursive style.

M.K. MILES, P.E
Acting Chief, Engineering and Construction
Directorate of Civil Works

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