Appendix W

Drinking Water Resource Management

W-1. Purpose. This appendix establishes policy, responsibilities and procedures to ensure that all water supplies destined for public consumption be pure water.

W-2. Key Applicable Regulations.

a. The Safe Drinking Water Act (SDWA) regulates the safety of drinking water and applies to public water systems in the country. Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. The Commonwealth of Virginia has primacy for enforcing compliance with the SDWA.

b. The governing Commonwealth of Virginia regulation affecting Fort Eustis and Fort Story's drinking water is 12 VAC 5-590, Virginia Waterworks Regulations.

c. Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*, mandates compliance with the SDWA, and applicable state and local requirements.

W-3. Policy.

a. Assist the installation mission by ensuring that our training environment will maintain its high quality and continue to support training operations through time; protect human health by providing clean and healthful drinking water; and ensure that Fort Eustis and Fort Story achieves and maintains compliance with all applicable environmental laws and regulations. This policy applies to all water distribution systems at Fort Eustis and Fort Story.

b. Conserve water resources through the use of water-saving techniques, including devices, fixtures, methods, and recycle and reuse technology.

c. Provide clean, safe drinking water.

d. Cooperate with federal, state, regional and local authorities in local water planning efforts.

e. Monitor, evaluate and minimize any adverse effects of mission activities on water resources and water quality.

W-4. Background.

a. The following is some background information on the Fort Eustis water distribution system:

(1) Fort Eustis is a consecutive water system purchasing water from the City of Newport News Waterworks. The water distribution system is comprised of RPZ valves, a booster pump station, over 46 miles of predominantly unlined cast iron pipe, storage facilities which provide a total storage capacity of 1,081,000 gallons (700,000 gallons domestic and 381,000 gallons fire), and two emergency wells that can be connected to the system should the city's water supply fail.

(2) Most water quality monitoring is conducted by Newport News Waterworks; however, Fort Eustis is required to conduct monthly bacteriological monitoring, quarterly trihalomethane (THM)s monitoring, and lead and copper monitoring every three years. The current bacteriological monitoring plan, approved by the Virginia Department of Health, requires Fort Eustis to sample fifteen (15) designated sites per month.

(3) In 1998, after many years of using chlorine as the only disinfectant in their water treatment process, Newport News Waterworks converted to chloramines, a combination of chlorine and ammonia. The conversion was made to reduce the levels of trihalomethanes, a by-product of drinking water chlorination and suspected carcinogen, and also reduce the taste and odor associated with chlorine. In preparation for the conversion to chloramines, Fort Eustis, with assistance from members of US Army Center for Health Promotion and Preventive Medicine (USACHPPM) and McDonald Army Community Hospital, Preventive Medicine Services, flushing of the distribution system was conducted and hydrants were flowed to ensure chloraminated water was drawn to all areas of the distribution system. Monitoring was expanded to include quarterly heterotrophic plate counts, nitrates, and nitrates at various locations within the distribution system.

(4) During the month of July 1999, Fort Eustis received four positive total coliform samples. Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, bacteria may be present. This amount exceeded the maximum contaminant level (MCL) for total coliform and a Notice of Violation (NOV) was issued by the Virginia Department of Health. Fort Eustis continued to exceed the MCL for total coliform for the months of August – November 1999. A total of four NOVs were received for 1999, one of which was issued for a two-month sampling period. All NOVs were resolved by publishing the mandatory public notification in the installation newspaper and disseminating copies of the notification to all activities on the mailing distribution system.

(5) In November 2000, Fort Eustis was placed on the Environmental Protection Agency (EPA) list of Significant Non-Compliers for these repeated violations. In March 01, Fort Eustis entered into a Consent Order with the VDH.

(6) During FY00, Fort Eustis was funded for repairs and assessments on the water distribution system. Such assessments included a distribution system storage capacity analysis, inspection of all water storage tanks, a water quality monitoring plan, development of a unidirectional flushing program, a leak detection survey, preparation of an operation and maintenance plan, development of a hydraulic/water quality model, and evaluation of the existing Facility Monitoring System (FMS). Corrective actions taken based on assessment findings include the repair/replacement of deficient altitude and system isolation valves, repair of leaks which reduced the average daily water consumption by approximately 300,000 gallons per day, installation of additional sampling stations for monitoring purposes, installation of automatic flushing devices to maintain disinfectant residuals in areas with extended detention times, and automation of the booster by-pass valve. Assessments concluded that previous tank management schemes, excess storage of water, water age within the distribution system, and the continual deterioration of an aged and poorly maintained water distribution system are contributing factors negatively impacting the quality of water being delivered to Fort Eustis customers.

(7) In FY01 and FY02, Fort Eustis continued to upgrade the water distribution system. Projects included the replacement of approximately 19,800 feet of 6", 8" and 10" water lines and the demolition of one 200,000-gallon water storage tank.

b. The following is some background information on the Fort Story water distribution system:

(1) Fort Story purchases potable water from the City of Norfolk that is delivered via the City of Virginia Beach distribution system. Water enters the Fort Story distribution system via a 12-inch diameter main, passing through two-meter vaults located at the east and west gates. The meter vaults are owned by the City of Norfolk. The distribution system is comprised of approximately 117,000 linear feet of cast iron, polyvinyl chloride, and some asbestos cement piping, ranging in size from less than 2 inches to 12 inches in diameter, with the latest major upgrades taking place in 1989. A 600,000 gallon elevated storage tank provides storage.

(2) Fort Story is classified as a Class V waterworks by the VDH. Operation and maintenance of the system is currently handled by the Navy Public Works Center through an Inter-Service Support Agreement.

(3) In accordance with VDH waterworks regulations, Fort Story has established a bacteriological monitoring program for the on-post water distribution system. Six sampling locations have been approved; however, the monitoring program requires that only three of these locations be sampled on rotation each month. The collection and analysis of monthly bacteriological samples is conducted by the Navy Public Works Center Environmental Laboratory Services. Fort Story is also required to monitor for lead and copper on a three-year cycle. Lead and copper samples are collected by facility occupants and analyzed by a contracted laboratory.

(4) During the fall of 2000, South Hampton Roads water utilities, including Norfolk and Virginia Beach, converted from chlorine to chloramines in their disinfection process. This conversion was made to improve the quality of drinking water and meet new federal and state regulations governing disinfection byproducts. In preparation for the conversion, the Navy Public Works Center implemented a comprehensive water line flushing program throughout Fort Story

W-4. Responsibilities. Responsibilities for compliance with the above stated policy items, and with the goals established by the SDWA, and other federal, state and local laws and regulations are stated below.

a. Directorate of Public Works (DPW) will exercise overall staff responsibility for drinking water management and ensuring compliance with applicable laws and regulations.

b. The Environmental and Natural Resources Division (ENRD), DPW, will:

(1) Coordinate with federal, state, regional, and local agencies and authorities to ensure safe pure drinking water quality.

(2) Review master plans, construction plans, and other activities for impacts on the drinking water distribution system.

(3) Ensure compliance with the Virginia Department of Health Consent Order issued on 15 March 2001.

(4) Apply for and obtain applicable permits required by federal, state and local regulations, including Construction Permits as specified by 12 VAC 5-590-190, Permits. No owner or other person shall cause or allow the construction or change in the manner of transmission, storage, purification, treatment, or distribution of water (including the extension of water pipes for the distribution of water) at any waterworks or water supply without a written construction permit from the Virginia Department of Health.

(5) Coordinate with other DPW divisions in the identification, budgeting, reporting, engineering, design and construction of water distribution projects.

c. The Public Works Division (PWD) will operate the Fort Eustis' water distribution system in accordance with all applicable laws and regulations.

d. The Navy Public Works Center through an Inter-Service Support Agreement will operation and maintain the Fort Story water distribution system in accordance with all applicable laws and regulations.

W-5. Drinking Water Regulations, Standards And Procedures. The actions described below are major aspects of drinking water management on Fort Eustis and Fort Story. Compliance with applicable requirements is mandatory for all organizations and personnel on the installations. Additional details are available from ENRD, DPW.

a. Protection of Drinking Water Quality.

(1) Drinking water quality will be managed by the ENRD.

(2) Cross-connection control (backflow protection).

(a) All installations of backflow protection devices shall be made in accordance with applicable standards and procedures.

(b) No connection will be made between a potable water line and any other line or container carrying a non-potable fluid, such that it is possible for the non-potable fluid to enter the potable system by backflow.

(c) Annual testing of backflow prevention devices in buildings and facilities maintained by PWD will be coordinated by the ENRD. All other water users on Fort Eustis and Fort Story will ensure completion of the testing and will submit results to ENRD.

b. Water Conservation.

(1) Fort Eustis and Fort Story are consecutive water systems with the City of Newport News and the City of Norfolk, respectively. Both installations will enforce/mirror any water conservation advisories or water restrictions imposed by the City of Newport News or the City of Norfolk.

W-6. Reports And Investigation Of Complaints. Complaints about drinking water quality or other types of water pollution will be submitted to ENRD (878-4123). Complaints from off-post sources will be referred to the Public Affairs Office (878-4920). Inquiries from state or federal agencies regarding pollution reporting or investigations will be referred to the ENRD.