

**BY ORDER OF THE  
SECRETARY OF THE AIR FORCE**

**AIR FORCE INSTRUCTION 48-144**

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***Aerospace Medicine***

***DRINKING WATER SURVEILLANCE  
PROGRAM***

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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Drinking Water Surveillance Program. This publication implements Environmental Protection Agency (EPA) regulations promulgated under the authority of the Safe Drinking Water Act (SDWA) and Air Force Policy Directive (AFPD) 48-1, *Aerospace Medicine Enterprise*. AFPD 48-1 directly supports AFPD 90-8, *Environment, Safety, and Occupational Health*. Requests for waivers must be submitted through the chain of command to the appropriate Tier waiver approval authority or alternately, to the Publication OPR for non-tiered compliance items. The authorities to waive wing/unit level requirements in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number following the compliance statement. See Air Force Instruction 33-360, *Publications and Forms Management*, for a description of the authorities associated with the Tier numbers. This instruction applies to AF, Air National Guard and AF Reserve installations and all responsibilities herein are conferred to the host, and responsibility shall not be delegated or otherwise assigned to tenant organizations. Major Commands (MAJCOM) may issue supplementary criteria that are more protective of human health than that specified in this instruction provided they clearly identify variances. However, MAJCOMs may not issue more protective criteria for overseas installations without prior coordination from the relevant DoD Lead Environmental Components (LECs). For privatized drinking water systems, AF drinking water surveillance responsibilities may be greatly reduced. Installation Bioenvironmental Engineers shall work closely with Civil Engineering and the privatization agreement Contracting Officer’s Representative to ensure AF requirements are met and both AF and system owner’s responsibilities are clearly delineated and understood. Where the Request for Proposal (RFP), Utilities Privatization (UP) contract, Right of Way, or Right of Access conflicts with this guidance, the RFP, UP contract, Right of Way, or Right of Access takes precedence. Ensure that

all records created as a result of processes prescribed in this publication are maintained IAW Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS)", or any updated statement provided by the AF Records Management office (SAF/CIO A6P). Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through the appropriate functional chain of command.

### ***SUMMARY OF CHANGES***

The publication has been revised to assign Tiers to requirements per AFI 33-360, clarify DW surveillance responsibilities of BE at installations with privatized DW systems, and to transfer procedural information to the Drinking Water Surveillance Technical Guide (DWSTG).

## Chapter 1

### PROGRAM OVERVIEW

**1.1. Overview.** This Air Force Instruction (AFI) provides guidance for managing and implementation of the Air Force (AF) drinking water (DW) surveillance program. It applies at enduring locations worldwide, in order to implement and/or supplement Department of Defense Instruction (DoDI) 4715.5, *Management of Environmental Compliance at Overseas Installations*, the Code of Federal Regulations (CFR), applicable state and local regulations, the Overseas Environmental Baseline Guidance Document (OEBGD), and applicable Department of Defense Final Governing Standards (FGS).

**1.2. Applicability.** At installations outside the United States and its territories, i.e. overseas, AF-unique criteria listed in this instruction and not included in the OEBGD or applicable FGS will be followed. Installations in the United States and its territories are required to comply with the most stringent applicable standards (AF, Federal, State or Local).

## Chapter 2

### ROLES AND RESPONSIBILITIES

#### **2.1. The Deputy Assistant Secretary of the Air Force for Energy, Environment, Safety and Occupational Health (SAF/IEE):**

- 2.1.1. Develops overarching DW program policy for Secretary of the Air Force approval.
- 2.1.2. Acts as liaison for AF DW issues to Office of the Secretary of Defense, the Congress and other Federal organizations.
- 2.1.3. Provides strategic direction, oversight and guidance for the AF DW Program.

#### **2.2. The Air Force Surgeon General (HQ USAF/SG):**

- 2.2.1. AF/SG is the Office of Primary Responsibility for providing health oversight, hereby referred to as DW surveillance, of AF DW systems. Ensures AF DW systems are properly surveyed, sampled, analyzed and monitored to provide adequate supplies of safe DW to AF personnel at garrison and deployed locations.
- 2.2.2. Establishes resources and implementation instructions for DW Surveillance Program. Ensures compliance with applicable regulatory requirements and standards associated with the protection of public health. Coordinates with AF/A7C on these matters.

#### **2.3. The Air Force Medical Support Agency (AFMSA):**

- 2.3.1. Develops AF policies for DW surveillance and establishes AF DW requirements to protect the health of AF personnel.
- 2.3.2. Serves as the Chair of the DoD SDWA Services Steering Committee (SSC) on behalf of SAF/IEE.
- 2.3.3. Provides SDWA oversight for DW surveillance to include analysis of present and proposed federal legislation associated with SDWA surveillance. In coordination with AF/A7C and AFMOA, notifies AF ESOH Council, SAF/IEE, AFLOA/JACE, MAJCOM Bioenvironmental Engineers (BEEs) and installation Bioenvironmental Engineering (BE) offices with results of these analyses. For overseas installations, provides DW surveillance to include analysis of proposed changes to OEBGD and FGS regarding DW.
- 2.3.4. Approves DW related readiness skills verification training plans.
- 2.3.5. Provides research, acquisition support and services, in collaboration with other services to address Joint DW issues.

#### **2.4. The Air Force Medical Operations Agency (AFMOA):**

- 2.4.1. Establishes a planning, programming and budgeting mechanism to advocate for and distribute Defense Health Program (DHP) funds to conduct DW surveillance. Validates Major Command (MAJCOM) SG budget submittals for conducting the DW surveillance program and oversees budgeting, programming and execution of DW surveillance programs throughout the AF.
- 2.4.2. Serves as an AFMOA representative member of the DoD SDWA Services Steering Committee (SSC).

2.4.3. Analyzes open enforcement actions associated with SDWA surveillance for negative trends. In coordination with AFCEC, notifies AFMSA with results of these analyses.

2.4.4. Provides recommendations to AFMSA/SG3PB and MAJCOM BEEs on UEI focus areas, based on installation-specific performance, historic enforcement actions, inspection results and execution of new DW requirements.

## **2.5. The United States Air Force School of Aerospace Medicine (USAFSAM/OE and Detachment 3, USAFSAM):**

2.5.1. Provides technical consultations and assistance regarding drinking water quality surveys and monitoring requirements. (T-1)

2.5.2. Annually reviews and updates, as necessary, technical guidance documents to assist installations in interpreting and executing DW surveillance programs. These technical guidance documents include, but are not limited to, the DW Surveillance Technical Guide (DWSTG) and the Water Vulnerability Assessment Technical Guide. The DWSTG directly complements this instruction. (T-2)

2.5.3. Provides specialized field surveys and studies and/or technical assistance to installations with DW quality issues. (T-2)

2.5.4. Offers contract laboratory analytical services to installations. Ensures analyses are performed by a laboratory that is certified by the appropriate authority for the installation submitting the sample, and reports results IAW appropriate requirements. (T-1)

2.5.5. Develops readiness skills verification training material for any DW related task included in the readiness skills verification plan. (T-1)

2.5.6. Upon request by an installation, reviews commercial (US, overseas, and deployed/contingency location) laboratory quality assurance and quality control programs. (T-2)

2.5.7. Develops and teaches curriculum on technical aspects of DW systems, DW science, requirements of the SDWA and this instruction to Bioenvironmental Engineers (BEE) and Bioenvironmental Engineering (BE) technicians. (T-1)

## **2.6. The Air Force Civil Engineer (AF/A7C):**

2.6.1. Ensures AF DW systems are properly designed, constructed, operated and maintained to provide adequate supplies of potable DW to AF personnel and ensures compliance with applicable regulatory requirements or standards associated with infrastructure and operations.

2.6.2. Directs a sustainable asset management approach for investment planning in support of DW requirements. Establishes an Activity Management Plan process and associated common level standards ensuring desired outcomes in support of mission achievement. Operations and infrastructure requirements shall be planned, programmed and budgeted consistent with the most efficient lifecycle cost.

## **2.7. The Air Force Civil Engineer Center (AFCEC):**

2.7.1. Issues DW system design and operations & maintenance guidance; provides technical assistance to MAJCOMs and installations.

2.7.2. Provides a contracting mechanism for engineering studies, water distribution and treatment system design, and Operations, Maintenance, and Training Assistance Programs (OMTAP).

2.7.3. Manages housing and installation utilities privatization contracts.

2.7.4. Assists MAJCOMs and installations in resolving regulatory issues. When necessary, coordinates with the Gatekeepers and MAJCOM prior to base visits, as well as provides the summary of activities to parent MAJCOM following visits.

2.7.5. Provides AF representation to Federal, state and local regulators. Where appropriate and in consultation with the installation and MAJCOM, the Regional Environmental Office (AFCEC/RO) may represent an installation to Federal, state and local regulators.

2.7.6. Working through the SDWA Services Steering Committee, provides AF comments on proposed federal regulations. AFCEC/ROs comment on state and local drinking water regulations impacting AF operations.

2.7.7. Maintains AF database of all environmental regulatory Open Enforcement Actions (OEAs) and their status. Confirms OEA closure with appropriate regulators upon completion of required corrective actions and training.

2.7.8. Provides water system privatization technical guidance to AF installations, MAJCOMs and HQ AF, upon request.

## **2.8. Major Commands (MAJCOMs):**

2.8.1. MAJCOM Commander or equivalent.

2.8.1.1. For MAJCOM's that have oversight of overseas facilities, designates a medical support professional (usually the MAJCOM BEE) to fulfill the role of "appropriate DoD medical authority" as specified in DoD 4715.05-G, *Overseas Environmental Baseline Guidance Document* (OEBGD), and country-specific final governing standards (FGS).

2.8.2. MAJCOM BEE.

2.8.2.1. Supports installations to ensure the DW surveillance program conforms to this instruction.

2.8.2.2. Reviews and validates installation programming and budget needs for conducting the DW surveillance program.

2.8.2.3. When designated by MAJCOM Commander or equivalent, serves as "appropriate DoD medical authority" (as specified in the OEBGD and country-specific FGS) for Air Force installations in overseas locations.

2.8.2.4. Serves as the OPR for MAJCOM coordination on country-specific environmental governing standards for DW in overseas locations.

2.8.3. MAJCOM Civil Engineer.

2.8.3.1. Implements a sustainable asset management approach and activity management plans for installations to ensure DW systems are properly designed, constructed, operated, and maintained in order to provide adequate supplies of safe DW to base personnel while ensuring compliance with applicable regulatory requirements or

standards associated with infrastructure and operations. Assists installations in resolving regulatory issues with technical expertise from AFCEC and respective AFCEC/RO.

2.8.3.2. Ensures installations use the established planning, programming and budgeting mechanism to secure funds to execute DW projects to support system design, operations and infrastructure, sustainment, restoration and modernization.

2.8.3.3. Validates installation Civil Engineering (CE) programming and budget submittals and transmits to HQ USAF/A7C.

## **2.9. Installations.**

### **2.9.1. The Installation Commander.**

2.9.1.1. Oversees implementation of the installation DW program. The DW program is implemented by installation agencies (BE, CE, Environmental Management, Judge Advocate, and Public Affairs) in coordination with MAJCOMs, Combatant Commands, Joint Service, federal, state, and local agencies, public and private purveyors of water, and the surrounding community, as appropriate. (T-1)

2.9.1.2. Establishes an Installation DW Working Group which meets to address all local DW issues involving compliance, risk reduction and continuous improvement. The DW Working Group will establish procedures for interfacing with regulators on matters such as enforcement actions, reporting of compliance/non-compliance, and any other local DW concerns that may arise. (Note: For privatized water systems, the system owner is the liaison to regulatory agencies, so these procedures are not necessary.) This workgroup will operate under the auspices of the Installation ESOH Council per guidance in AFI 90-801, *Environment, Safety, and Occupational Health Councils*. (T-2)

### **2.9.2. Bioenvironmental Engineering.**

2.9.2.1. Privatized Drinking Water Systems. At installations with privatized water systems, the system owner is generally responsible for operating and maintaining the drinking water system as well as compliance with the Safe Drinking Water Act. However, there may be some installations where the AF still retains some public water system responsibilities. Therefore, BE *must* coordinate with the local Contracting Officer's Representative to ensure responsibilities are understood by all parties. Generally, the following functions shall be performed by BE at installations with privatized water systems:

2.9.2.1.1. Ensures water vulnerability assessments are completed IAW AFMAN 10-246, *Food and Water Protection Program*, and USAFSAM WVA Technical Guide. (T-1)

2.9.2.1.2. Conducts Air Force-unique surveillance as described in paragraph 2.2. (T-1)

2.9.2.1.3. Completes annual and long range budget plans to support AF-unique surveillance as described in paragraph 2.2. (T-2)

2.9.2.1.4. Maintains analytical data records in DOEHRS for those samples taken by BE (i.e., Air Force unique surveillance). (T-2)

- 2.9.2.1.5. Maintains copies of the system owner's annual consumer confidence reports in DOEHRS. (T-3)
- 2.9.2.1.6. Participates in the installation water working group IAW **paragraph 2.9.1.2.** (T-2)
- 2.9.2.1.7. Works through the local privatization Contracting Officer's Representative to request access to the system or assistance from the system owner, or to address concerns with the drinking water. (T-2)
- 2.9.2.2. For Non-privatized Drinking Water Systems, BE:
- 2.9.2.2.1. Performs DW surveillance associated with the protection of public health. (T-0; 40 CFR 141)
- 2.9.2.2.2. Develops a DW SAM plan that includes the contents described in paragraph 4.1, and applicable primacy agency guidance. (T-1)
- 2.9.2.2.3. Ensures laboratories perform analyses using required analytical methods for which they are certified. (T-0; 40 CFR 141)
- 2.9.2.2.4. Interprets results of water analyses and provides results to the appropriate CE, SG and regulatory authorities according to applicable regulations. (T-0; 40 CFR 141)
- 2.9.2.2.5. Interacts with regulator on DW compliance issues pertaining to sampling. Note: Substantive interactions with federal, state or local compliance offices must be coordinated with the Installation DW Working Group. (T-0; 40 CFR 141)
- 2.9.2.2.6. Ensures sanitary surveys are performed to satisfy the requirements of applicable regulations and standards and recommends mitigation actions by appropriate CE or SG organizations to maintain the sanitary quality of the base DW system. Ensures special surveys of the DW system address potability and sanitary conditions affecting the installation DW system. For detailed sanitary survey guidance, refer to the DWSTG. (T-0; 40 CFR 141)
- 2.9.2.2.7. Ensures water vulnerability assessments are completed IAW AFMAN 10-246, and USAFSAM WVA Technical Guide. (T-1)
- 2.9.2.2.8. Monitors, approves and samples aircraft watering points as described in the DWSTG. (T-1)
- 2.9.2.2.9. Immediately implements the public notification procedures described by the primacy agency when DW analysis results indicate a potential public health threat or result in non-compliance with applicable regulations and standards. Assists the Public Affairs Office in the preparation of Public Notifications. BE will be responsible for associated costs (e.g., newspaper bulletins and other administrative costs) for drinking water notifications involving public health or compliance issues. BE will also notify CE, PH and MAJCOM BEE. (T-0; 40 CFR 141)
- 2.9.2.2.10. If appropriate, initiates requests for waivers, exemptions and reduced monitoring rates. Note: Substantive interactions with federal, state or local compliance offices must be coordinated with the Installation DW Working Group.



For overseas installations, follow the waiver and exemption processes specified in the OEBGD and country-specific FGS. (T-0; 40 CFR 141)

2.9.2.2.11. Prepares, coordinates and distributes Consumer Confidence Reports (CCR) as necessary to comply with applicable regulatory requirements and this instruction. (See [Chapter 5](#)) (T-0; 40 CFR 141)

2.9.2.2.12. Supports CE by conducting technical reviews of planned repairs, renovations and modifications to DW systems to assess and avert potential health hazards. (T-1)

2.9.2.2.13. Supports the cross-connection control and backflow prevention program by providing technical assistance and assigning the correct hazard classification to each cross-connection using the most recent Uniform Plumbing Code criteria and AFI 32-1066, *Backflow Prevention Program*. Forwards recommendations to the Backflow Prevention Manager (BPM). (T-1)

2.9.2.2.14. Advises commanders on source water protection opportunities, physical modifications to enhance water treatment and distribution systems, and alternative management practices to meet compliance requirements and enhance water quality. (T-1)

2.9.2.2.15. Determines the population served in accordance with primacy agency regulations and the Drinking Water Surveillance Technical Guide (DWSTG); provides this population information to CE. (T-0; 40 CFR 141)

2.9.2.2.16. Annually reviews the CE flushing and maintenance program. Coordinates as needed with CE for program updates. Reviews the CE distribution system flushing and maintenance program to ensure appropriate sampling locations and timing with CE distribution system maintenance activities, including hydrant maintenance and testing. Coordinates as needed with CE for program updates. (T-1)

2.9.2.2.17. Completes annual and long-range budget plans to support routine DW monitoring and analytical requirements associated with the health of the population served, National Primary Drinking Water Regulations (NPDWR) and state equivalents if applicable; including equipment, supplies, training and analytical costs. This budget shall include resources for the sampling, analysis, and monitoring (SAM) plan requirements in Chapter 3 of this instruction. Annual budget increases for a given fiscal year should be communicated to both the medical treatment facility (MTF) resource advisor and AFMOA/SGPB well before the fiscal year begins. Any additional sampling required to comply with DW regulations due to design deficiency, inadequate system maintenance, or aged infrastructure will be performed and funded by the system operator. (T-2)

2.9.2.2.18. Maintains DW survey and analytical data records in the Defense Occupational and Environmental Health Readiness System (DOEHRS) IAW the DWSTG. Provides data and technical support to physicians and public health personnel investigating potential DW-related illnesses. Shares data with principal stakeholders (e.g. CE, JA, PA) as necessary to support full operational compliance of the drinking water system and regulatory compliance tracking/reporting. (T-3)

2.9.2.2.19. Advises CE on potential health hazard impacts of any water system deficiencies or unusual events that could result in changes to water quality and potability including line breaks, distribution system maintenance (e.g., cleaning of reservoirs, storage tanks, hydrant flushing, etc.), new connections, water treatment plant repairs, cross-connections and disinfectant and fluoride application problems. Coordinates with CE until the system deficiencies are corrected. BE actions for the activities listed above can be found in the DWSTG. (T-1)

**2.9.3. Base Civil Engineer (BCE) shall:**

2.9.3.1. Overview. AFI 32-1067, *Water Systems*, designates the BCE as responsible for the design, construction, operation, and maintenance of drinking water systems, developing and maintaining an adequate supply of safe drinking water, conducting all activities associated with drinking water treatment processes (including monitoring and recordkeeping of water parameters as required by regulations), and ensuring the water system has required regulatory permits and sufficient resources to operate in compliance. The BCE is also responsible for developing and implementing the wellhead protection plan, water master plan, source water assessment program, and Contingency Response Plan (CRP) associated with operating and maintaining safe drinking water system. CE and BE work closely together to bring the distribution system back on-line after any unusual event occurs that may affect water quality or potability. The BCE is also responsible for conducting a cross-connection control and backflow prevention program in accordance with AFI 32-1066, *Backflow Prevention Program*, and correcting any distribution system deficiencies. (T-1)

2.9.3.2. Notifies BE of any unusual events affecting the water distribution system that could result in changes to water quality and potability including line breaks, new connections, distribution system maintenance (e.g., cleaning of reservoirs, storage tanks, hydrant flushing, etc.), cross-connections, water treatment plant repairs, and chlorine and fluoride application problems. Systems experiencing any of the aforementioned events will not be placed back into service until approved by BE. Organizational facility maintenance, Operations and Maintenance (O&M) and Utilities Privatization contractors must also comply with this requirement. (T-1)

2.9.3.3. Pays for all DW system permit fees and service fees IAW primacy requirements. (T-0; 40 CFR 141)

2.9.3.4. Supports BE in developing and maintaining a SAM plan. (T-1)

**2.9.4. Public Affairs.**

2.9.4.1. Develops (with the assistance of the BEE and the BCE) and disseminates public notices required by the NPDWRs (or equivalent overseas). (T-0; 40 CFR 141)

2.9.4.2. Assists in the dissemination of the CCR (or equivalent). BE can provide information from the DWSTG for general guidance on complying with public notification requirements. Installation personnel must notify their MAJCOM counterparts about public release of the information. (T-0; 40 CFR 141)

**2.9.5. Staff Judge Advocate.**

2.9.5.1. Provides legal consultation on SDWA regulatory requirements applicable to the AF. For overseas installations, provides legal advice and support regarding DW requirements and issues. (T-1)

## Chapter 3

### GUIDANCE AND PROCEDURES

#### 3.1. Surveillance.

3.1.1. Overview. BE conducts surveillance IAW all DoD, MAJCOM, Combatant Command, Joint Service, AF, federal, and local primacy agency guidance, and DoD OEBGD/FGS regulations as applicable. (T-0; 40 CFR 141)

3.1.2. Disinfectant Surveillance. Water production personnel will ensure that adequate disinfectant residual monitoring is performed, both at the point of production, and at various points in the distribution system. Treated water shall be tested by CE prior to entry into the distribution system at least daily; however, if the character and variability of the water supply so dictates, test more often and at several locations. BE must test at various points in the distribution system during routine DW surveillance (i.e. disinfectant residuals and disinfectant byproducts) or during other investigations as appropriate. For instructions on testing for specific analytes and water quality measures, refer to the DWSTG and applicable state/local requirements. (T-0; 40 CFR 141)

3.1.3. Emergency Disinfection. CE and BE personnel will follow applicable regulations for emergency disinfection of water lines, water storage tanks and water treatment facilities. If no primacy agency regulations exist, CE and BE will follow industry standards for disinfection (e.g., American Water Works Association). CE will consult and coordinate disinfection procedures with BE. For additional emergency disinfection guidance, refer to the DWSTG and applicable state/local requirements. (T-1)

3.1.4. Overseas installations will coordinate all requests for reduced monitoring under the FGS with the MAJCOM Surgeon prior to submission to the DoD LEC. (T-1)

3.1.5. Fluoridation. Installations that own or operate a potable water treatment facility serving 3,300 persons or more must provide optimally fluoridated water beginning in Fiscal Year 2016. The DWSTG shows recommended fluoride levels; however, primacy agency requirements may take precedence over these recommendations. Overseas installations will fluoridate if applicable, but must comply with OEBGD/FGS policy on DW fluoridation. For specific instructions on fluoridation of AF water systems and associated surveillance, refer to the DWSTG. When fluoride is added to DW, water treatment personnel must monitor product water at frequencies and locations as determined by the agency with primacy. (T-0; DUSD (IE) Policy 18 Mar 2013, UFC 3-230-03 Water Treatment, Nov 2012)

#### 3.2. Air Force-Unique Surveillance.

3.2.1. Aircraft Watering Points. As a minimum, BE will sample aircraft watering points monthly for bacteriological analysis. In addition, BE will perform a sanitary survey of aircraft watering points at least annually. Conduct surveillance and surveys IAW the DWSTG. (T-1)

3.2.2. Child Development Centers (CDC), School Age Programs (SAP), Youth Programs (YP), Department of Defense Dependent Schools (DODDS), and Domestic Dependent Elementary and Secondary Schools (DDESS). (T-1)

3.2.2.1. BE will collect or arrange for collection of a monthly DW sample for bacteriological analysis from each CDC, SAP, YP, DODDS and DDESS it supports. BE shall coordinate with the primacy agency to determine if these samples must be included in compliance sampling requirements. Refer to the DWSTG for more information on. (T-1)

3.2.2.2. Lead. Prior to opening a new CDC, SAP, YP, DODDS, or DDESS facility, and when plumbing lines or fixtures are modified, added, or replaced, BE will ensure initial sampling is performed using the protocols specified in the DWSTG. BE will provide a copy of the results to the facility. (T-1)

3.2.2.2.1. The director of the CDC, SAP, YP, DODDS, DDESS will coordinate with BE prior to opening a new facility and when plumbing lines or fixtures are modified, added or replaced; and will send a memo to the BEE annually, documenting any plumbing changes (or lack thereof) within the past year. (T-1)

3.2.2.2.2. CDC, SAP, and YP directors, DODDS and DDESS officials will ensure that analytical results for DW lead concentrations from sampling performed IAW [paragraph 2.2.3.2](#) are on file in the CDC, SAP, YP, DODDS, and DDESS administrative offices, respectively. Any corrective actions identified to mitigate sources of lead contamination must be accomplished or the facility closed or bottled water provided until corrective actions are accomplished. (T-1)

3.2.2.2.3. BE will conduct an annual review to ensure (1) lead sampling results are on file for each facility; (2) any identified follow-up actions are closed or in progress; and (3) the most recent annual memo prepared IAW [paragraph 2.2.3.2.1](#) is on file. If BE cannot locate lead sampling results for a particular CDC, SAP, YP, DODDS, or DDESS facility, the sampling must be re-accomplished and documented. (T-1)

3.2.3. BE will record sampling results specific to the CDC, SAP, YP, DODDS or DDESS in DOEHRs and provide copies to the CDC, SAP, YP, DODDS or DDESS for their records. Program directors or DODDS/DDESS officials will also maintain a copy of the most current CCR in the respective CDC, SAP, YP, DODDS and DDESS administrative office. BE will refer to the DWSTG for detailed information on lead issues. (T-1)

3.2.4. Lead and Copper Rule (LCR) sampling will be done IAW 40 CFR 141.86. (T-0; 40 CFR 141) For overseas installations, obey OEBGD, FGS, or applicable operation plan or directive environmental annex requirements, whichever apply. (T-0)

3.2.4.1. Even though the LCR does not specifically apply to CDC, SAP, YP, DODDS, and DDESS, when changes are made to water sources, treatment, or distribution system that may increase lead concentrations, BE will sample for lead at all high-priority taps located in CDC, SAP, YP, DODDS, DDESS. When Lead and Copper Rule (LCR) sample results exceed the LCR action level, BE will use risk assessment principles to determine what, if any, additional sampling should be conducted at the CDC, SAP, YP, DODDS, DDESS. (T-1)

3.2.4.2. Overseas Installations.

3.2.4.2.1. Monitor for or ensure monitoring is performed for lead and copper compliance in housing and other facilities leased or owned by the US Government

regardless of water system ownership. (T-0; DoD Overseas Environmental Baseline Guidance Document)

3.2.4.2.2. Ensure initial sampling for lead and copper compliance is performed when changes in the water source or water treatment can potentially result in increased lead or copper concentrations. (T-0; DoD Overseas Environmental Baseline Guidance Document)

### 3.3. Cross-Connection and Backflow Prevention Program.

3.3.1. A program to identify, isolate, record, and correct cross-connections and other potential sources of distribution system contamination will be conducted IAW AFI 32-1066, *Backflow Prevention Program*. CE will maintain the inventory of cross-connections and backflow prevention devices. Every five years, BE will assist the BPM and BCE personnel to survey all facilities and water-using equipment and systems. Alternatively, an annual survey of 20 percent of the facilities and devices may be performed. "The BEE will review the inventory and update or assign health hazard classifications for cross-connections using guidance established in the latest edition of the Uniform Plumbing Code. Health hazard classification updates will be made when new surveys are completed or updated IAW AFI 32-1066 Section 7.1 or when the UPC is updated (every 3 years)." The BEE will review the inventory and update or assign health hazard classifications for cross-connections using guidance established in the latest edition of the Uniform Plumbing Code. (T-0; 40 CFR 141)

3.3.2. During construction design reviews, the BEE will assist the base backflow prevention program manager in recommending appropriate backflow prevention devices where equipment plumbed to potable water supplies is being installed. Refer to the DWSTG and applicable state/local requirements for specific cross-connection and backflow prevention information. (T-0; 40 CFR 141)

### 3.4. Flushing. (T-1)

3.4.1. CE develops and executes the installation flushing program IAW Unified Facilities Criteria (UFC) 3-230-02, *Operation and Maintenance: Water Supply Systems* to remove biofilm and deposited material, maintain water quality, meet disinfectant and disinfectant byproduct requirements and to maintain hydraulic conductivity. Unidirectional flushing should be conducted at least once every 5 years (more frequently for cast iron pipe). CE will coordinate with BE on the installation distribution system flushing program to ensure health concerns and antiterrorism considerations are addressed. (T-1)

3.4.2. BE recommendations shall be supported with sample analysis results and findings from the BE surveys and the water vulnerability assessment. (T-1)

### 3.5. BE DW Survey.

3.5.1. For all garrison water systems, BE will perform or update the Water Vulnerability Assessment annually IAW AFMAN 10-246, *Food and Water Protection Program*, and USAFSAM WVA Technical Guide. (T-2) **Note: Do not enter WVA observations into DOEHS. Do not upload WVA reports to DOEHS.**

3.5.1.1. For CONUS garrison water systems, BE will survey or update sanitary aspects of the drinking water system and drinking water programs not covered in WVA protocols IAW the USAFSAM DWSTG. Sanitary deficiencies not documented in WVA reports

will be identified to the responsible organization and the Drinking Water Working Group for correction. (T-2)

3.5.1.2. For OCONUS garrison water systems, BE will perform a sanitary survey at least every 3 years for systems using surface water or groundwater under the direct influence of surface water, and every 5 years for systems using groundwater as required by the applicable FGS or the OEBGD. The sanitary survey may be performed in conjunction with WVAs. (T-2)

3.5.2. At deployed sites BE will perform or update the WVA IAW AFMAN 10-246 and the USAFSAM WVA Technical Guide within 60 days of arrival or on a schedule specified by the MAJCOM BEE. In conjunction with the WVA, BE will evaluate compliance with sanitary requirements of AFMAN 48-138 and, as appropriate, any country specific FGS. Any sanitary deficiencies not included in WVA reports will be documented and reported to the responsible organization for correction. (T-2)

3.5.3. For garrison water systems, the BE Flight Commander shall review the WVA report, sanitary deficiencies and the BE drinking water program within 60 days of assignment. The BE Flight Commander will complete the WVA review and documentation of sanitary deficiencies and certify as adequate, or schedule a new assessment. (T-3)

## Chapter 4

### SAMPLING, ANALYSIS, AND MONITORING (SAM) PLAN

#### 4.1. SAM Plan.

4.1.1. BE, with support from CE, shall create and annually review a SAM Plan to include the following elements:

4.1.1.1. Identification of all DW sampling sites used to protect the health of the population served and ensure compliance with the appropriate guidance and regulations. (T-0; 40 CFR 141)

4.1.1.2. Annual and long-range sampling schedule. (T-0; 40 CFR 141)

4.1.1.3. Identification of support laboratory for each contaminant and a confirmation annually that the laboratory holds the appropriate certification for the analyte(s) in question. Include procedures to verify the laboratory is using the appropriate QA/QC, achieving the prescribed detection limits, and reporting results IAW applicable regulatory requirements. (T-0; 40 CFR 141)

4.1.1.4. Locally developed procedures for conducting the DW surveillance program. These procedures must include a schedule for routine monitoring, monitoring of aircraft watering points, increased monitoring during contingencies or heightened Force Protection Condition, repeat and investigative sampling when installation violates a SDWA standard, and monitoring performed before placing new connections and repaired water mains or storage tanks into use. (T-0; 40 CFR 141)

4.1.1.5. A current map of each water distribution system showing locations of bacteriological, chemical, lead and copper, disinfection byproducts and radiological monitoring points. BE shall request CE include this information as part of a Geographical Information System and track locations of water system maintenance and complaint reports. (T-0; 40 CFR 141)

4.1.2. The primacy agency will approve the description and classification (e.g., community/non-community, transient/non-transient) of each Public Water System (PWS). Typically, BE responsibilities for PWS shall include geographically separated units supported by the parent Wing or Medical Group. These responsibilities will be agreed upon at the local level via memorandum of agreement (MOA) or memorandum of understanding (MOU) or Host-Tenant Support Agreements (HTSA) (T-3).

#### 4.2. Quality Assurance/Quality Control (QA/QC) Program.

4.2.1. Each BE unit shall implement a program for ensuring quality DW data. This includes but is not limited to recording periodic equipment calibration data, ensuring personnel training is relevant and current, incorporating proper sample collection techniques, and controlling chain-of-custody discipline to preserve samples as necessary. For detailed instructions on building an effective QA/QC program, refer to the DWSTG. (T-1)



## Chapter 5

### RECORD KEEPING AND REPORTING

#### 5.1. Consumer Confidence Reports. (CCR)

5.1.1. AF owned or operated PWS that are regulated as Community Water Systems (CWSs) are required to annually issue a CCR no later than 1 July. BE will develop the CCR IAW guidance from the primacy agency or the DWSTG if no primacy agency guidance exists. AF installations, including those with privatized DW systems that receive a CCR from a local water supplier will provide either the original or modified CCR to the base population, if not already providing their own CCR. If the original CCR is modified for distribution, ensure that modifications do not eliminate regulatory required content. (T-0, 40 CFR 141)

#### 5.2. Overseas Installations.

5.2.1. Unless otherwise required by the OEBCD or relevant country-specific FGS, whichever applies, AND after prior coordination with the appropriate DoD LEC, overseas enduring installations with PWSs that serve at least 15 service connections used by year-round residents, or regularly serve at least 25 year-round residents, will provide a water quality report through appropriate means to inform base customers by 1 July annually. These water quality reports may be modeled after the CCR, and will follow a MAJCOM BEE approved format. (T-2)

THOMAS W. TRAVIS  
Lieutenant General, USAF, MC, CFS, Surgeon  
General

## Attachment 1

### GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

#### *References*

Title 40, Code of Federal Regulations, Parts 141 - 143, *National Primary Drinking Water Regulations*, current edition

Public Law 93-523, 88 Stat. 1660 (1974), As Amended, *Safe Drinking Water Act*

AFMAN 10-246, *Food and Water Protection Program*, 4 December 2004; Certified Current 23 Dec 2010

AFI 32-1066, *Backflow Prevention Program*, 8 October 2007; Certified Current 20 Dec 2010

AFI 32-1067, *Water Systems*, 3 April 2013

AFI 32-7041, *Water Quality Compliance*, 10 December 2003; Certified Current 28 Jan 2010

AFI 90-801, *ESOH Councils*, 25 Mar 2005, Certified Current 29 Dec 2009

AFPD 48-1, *Aerospace Medicine Enterprise*, 23 August 2011

AFPD 90-8, *Environment, Safety, & Occupational Health Management and Risk Management*, 2 February 2012

DoDI 4715.05, *Environmental Compliance at Installations Outside the United States*, 1 November 2013

DoDI 4715.5-G, *Overseas Environmental Baseline Guidance Document*, 1 May 2007

*Standard Methods for the Examination of Water and Wastewater*, American Public Health Association, current edition

*Uniform Plumbing Code*, current edition

UFC 3-230-01, *Water Storage, Distribution, and Transmission*, 1 November 2012, With Change 1, 1 February 2014

UFC 3-230-02, *Operations & Maintenance of Water Supply Systems*, 10 July 2001

UFC 3-230-03, *Water Treatment*, 1 November 2012

*USAFSAM DW Surveillance Technical Guide*, current edition

*USAFSAM WVA Technical Guide*, October 2010

#### *Adopted Forms*

AF Form 847 - *Recommendation for Change of Publication*

#### *Abbreviations and Acronyms*

**AF**—Air Force

**AFCEC**—Air Force Civil Engineer Center

**AFI**—Air Force Instruction

**AFMOA**—Air Force Medical Operations Agency

**AFMSA**—Air Force Medical Support Agency  
**AWWA**—American Water Works Association  
**BCE**—Base Civil Engineer  
**BE**—Bioenvironmental Engineering  
**BEE**—Bioenvironmental Engineer  
**BPM**—Backflow Program Manager  
**CBRN**—Chemical, Biological, Radiological and Nuclear  
**CCR**—Consumer Confidence Report  
**CDC**—Child Development Center  
**CDS**—Chief of Dental Services  
**CE**—Civil Engineering  
**CEO**—Civil Engineering Operations  
**CFR**—Code of Federal Regulations  
**CWS**—Community Water System  
**DDESS**—Domestic Dependent Elementary and Secondary Schools  
**DOD**—Department of Defense  
**DODI**—Department of Defense Instruction  
**DODDS**—Department of Defense Dependent Schools  
**DOEHRS**—Defense Occupational and Environmental Health Readiness System  
**DWSTG**—Drinking Water Surveillance Technical Guide  
**EPA**—Environmental Protection Agency  
**FDA**—Food and Drug Administration  
**FGS**—Final Governing Standard  
**FMP**—Family Member Programs  
**HTSA**—Host-Tenant Support Agreement  
**IAW**—In Accordance With  
**LEC**—Lead Environmental Component  
**LCCA**—Lead Contamination Control Act  
**LCR**—Lead and Copper Rule  
**MAJCOM**—Major Command  
**MCL**—Maximum Contaminant Level  
**MOA**—Memorandum of Agreement

**MOU**—Memorandum of Understanding

**MTF**—Medical Treatment Facility

**NPDWR**—National Primary Drinking Water Regulations

**NTNCWS**—Non-Transient Non-Community Water System

**OEBGD**—Overseas Environmental Baseline Guidance Document

**OEHSA**—Occupational and Environmental Health Site Assessment

**O&M**—Operations and Maintenance

**PWS**—Public Water System

**QA/QC**—Quality Assurance/Quality Control

**REO**—Regional Environmental Office

**SAM**—Sampling, Analysis and Monitoring

**SAP**—School Age Program

**SDWA**—Safe Drinking Water Act

**TB MED**—Technical Bulletin Medical

**TNCWS**—Transient Non-Community Water System

**USAFSAM**—United States Air Force School of Aerospace Medicine

**WVA**—Water Vulnerability Assessment