



# Ames Procedural Requirements

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**COMPLIANCE IS MANDATORY**

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## Chapter 16 - Drinking Water Management

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### **16.1 Applicability**

This instruction requirement is applicable to all civil servant and contractor employees and resident agency personnel at Ames Research Center (Ames) and Moffett Field, Resident Agencies and NASA Research Park Partners, and Crows Landing.

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### **16.2 Purpose**

This chapter prescribes the roles and responsibilities for the monitoring of drinking water quality and the operations and maintenance of the water distribution system at Ames.

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### **16.3 Policy**

It is the policy of the Ames Research Center to:

1. Comply with all pertinent statutory and regulatory requirements and Executive Orders related to drinking water management. Ames recognizes and will comply with applicable Federal, state, and local regulations.
2. Consult about the best techniques and methods to manage drinking water, as appropriate, with Federal, state, and local agencies, including:
  - U.S. Environmental Protection Agency (EPA)
  - California Department of Health Services (DHS)
  - San Francisco Public Utility Commission (S.F.P.U.C.)
  - Santa Clara Valley Water District
  - Santa Clara County Health Department
  - State Water Resources Control Board
3. Promote employee awareness of drinking water quality through active information dissemination.

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## 16.4 Authority

All relevant Federal, state, and local laws and regulations related to drinking water quality and the operation and maintenance of the water distribution system:

1. Safe Drinking Water Act of 1974 (42 U.S.C. 300 et seq.), as amended in 1986, 1991, and 1996
2. Executive Order 12088, amended by Executive Order 12580, Federal Compliance with Pollution Standards
3. Code of Federal Regulations:
  - Title 40, Part 141, National Primary Drinking Water Regulations
  - Title 40, Part 143, National Secondary Drinking Water Regulations
4. California Code of Regulations:
  - Title 17, Sections 7583-7605, Drinking Water Supplies
  - Title 22, Chapter 15, Sections 64400-64501, Domestic Water Quality and Monitoring Regulations
  - Title 22, Chapter 16, Sections 64551-64644, California Waterworks Standards
  - Title 22, Chapter 17.5, Sections 64670-64692, Lead and Copper
5. California Health and Safety Code:
  - Section 4017
  - Sections 4049.50 and 4049.51
  - Section 13114.7
6. Uniform Plumbing Code.
7. American Society of Heating, Refrigeration, and Air Conditioning (ASHRAE)
  - G-12-2000, Minimizing the risk of Legionellosis associated with building water systems

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## 16.5 Responsibilities

### 16.5.1 Consumers of Drinking Water

1. Inform the Environmental Services Office, Code QE of any significant changes in the color, taste, or odor of drinking water.
2. Consume water only from designated drinking sources, such as bottled water, water coolers, fountains, kitchen areas, break rooms, etc.

3. Follow common safety practices by not using taps in laboratories, work shops, etc., as drinking water sources.
4. Heed any posted signs regarding drinking water use.
5. Do not alter drinking water systems in any manner without prior notification to, and approval from Codes FEF and QE.

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### **16.5.2 Environmental Services Office, Code QE, (Environmental Office)**

1. Identify laws and regulations to which Ames must adhere.
2. Develop Ames policy to implement the identified laws and regulations.
3. Provide oversight and direction.
4. Provide consultation, services, and support.
5. Provide routine and nonroutine drinking water-quality monitoring.
6. Respond to water-quality complaints.
7. Notify employees in the event of unsafe water quality.
8. Assist in the development of water-quality mitigation measures.
9. Assist in the development of backflow prevention and cross-connection control programs.
10. Assist in the development of emergency contingency plans.
11. Maintain records for the time intervals specified in the regulations:
  - Bacteriological--five years.
  - Complaints--three years.
  - Reports/Surveys--ten years.
12. Implement designated responsibilities as described in Appendix A, Legionella Management Policies, Procedures, and Practices

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### **16.5.3 Plant Engineering Branch, Code JFP**

[REDACTED]

[REDACTED]

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#### **16.5.4 Contracting Officers Technical Representatives**

Ensure that contractors working with the drinking water distribution system:

1. Perform all work in accordance with the Uniform Plumbing Code.
2. Notify the Plant Engineering Branch of any modifications to the original work specifications.
3. Notify FSM prior to work on plumbing systems that may impact, contaminate, or disturb the drinking water system in a facility.

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#### **16.5.5 Facilities Engineering Branch, Code FEF**

[REDACTED]

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#### **16.5.6 Safety, Health, and Medical Services, Code QH**

Implement the designated sections of the Legionella Management Policies, Procedures, and Practices as described in Appendix A.

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### **16.6 Definitions**

#### **16.6.1 Action Level**

The concentration of a contaminant in water that determines when control and/or notification measures are required. (40 CFR 141.2)

#### **16.6.2 Backflow Prevention**

Prevention of the reverse flow of contaminated water from a location back to the water

distribution system as a result of loss of pressure in the water mains.

### **16.6.3 Contaminant**

Any physical, chemical, biological, or radiological substance or matter in water. (40 CFR 141.2)

### **16.6.4 Cross Connection**

The connection of a nonpotable water line with a potable water line, usually enabled by backflow.

### **16.6.5 Disinfectant**

Any oxidant, including but not limited to chlorine, chlorine dioxide, chloramines, ozone, or ultraviolet light, added to water in any part of the treatment or distribution process that is intended to kill or inactivate pathogenic microorganisms. (40 CFR 141.2)

### **16.6.6 Disinfection**

A process that inactivates pathogenic organisms in water by chemical oxidants or equivalent agents. (40 CFR 141.2)

### **16.6.7 Maximum Contaminant Level**

The maximum permissible level of a contaminant in water that is delivered to any user of a public water system. (40 CFR 141.2)

### **16.6.8 Potable**

Fit to drink.

### **16.6.9 Primary Drinking Water Standards**

Concentrations of specified contaminants that, when exceeded, present a risk to the health of humans when continually used for drinking or culinary purposes.

### **16.6.10 Residual Disinfectant Concentration**

The concentration of disinfectant measured in milligrams per liter in a representative sample of water. (40 CFR 141.2)

### **16.6.11 Sanitary Survey**

An onsite review of a public water system for the purpose of evaluating the adequacy of the water source, facilities, equipment, operation, and maintenance for producing and distributing safe drinking water. (40 CFR 141.2)

### **16.6.12 Secondary Drinking Water Standards**

Levels of specified contaminants or physical properties that, when exceeded, may be objectionable to an appreciable number of people, but are not generally hazardous to health.

### 16.6.13 Total Trihalomethanes

The sum of the concentration in milligrams per liter of the trihalomethane compounds (trichloromethane, dibromochloromethane, bromodichloromethane, and tribromomethane). (40 CFR 141.2)

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## 16.7 Affected Operations

Any operation that affects the distribution of the potable water supply. Some examples of affected operations include water-line maintenance, fire hydrant flushing, repair, or replacement; backflow-prevention-device maintenance, repair, or replacement; modifications to interior plumbing; or water-cooler maintenance.

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## 16.8 Requirements

### 16.8.1 Routine Monitoring

The Environmental Services Office collects water samples at designated time intervals from routine monitoring locations to ensure that the drinking-water supply at Ames is safe for consumption. Routine monitoring locations are selected to provide water-quality data from the three sources and at a distribution location of each of the three drinking-water distribution systems servicing Moffett Field.

The Environmental Services Office conducts quarterly monitoring from the three main distribution lines that supply Ames. In addition, the Environmental Services Office conducts routine monitoring at high use and high risk building water systems from the following buildings on a rotational basis:

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

1. Sample routine monitoring locations quarterly for:

- Total coliform and E. coli
- Chlorine residual--If chlorine residual is not detected, conduct a heterotrophic plate count to verify the presence of disinfectant.
- pH
- Temperature
- Conductivity
- Total trihalomethanes

- General physical characteristics (color, odor, and turbidity).
- General mineral characteristics (alkalinity, calcium, chloride, conductivity, foaming agents, hardness, iron, magnesium, manganese, pH, potassium, sodium, sulfate, total dissolved solids, and zinc).
- Inorganic characteristics (aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, copper, cyanide, fluoride, lead, mercury, nickel, nitrate, nitrite, selenium, silver, and thallium).

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### **16.8.2 Drinking Water Complaints**

To evaluate water-quality concerns identified by civil servant or contractor employees or resident agency personnel, NASA Research Park partners, and the Environmental Office shall:

1. Interview complainant to gather relevant information.
2. Visually examine the water.
3. If necessary, collect samples and analyze for the most likely contaminants.
4. Provide emergency notification request Code JFP to disable suspect water source, if necessary.
5. Assist Plant Engineering Branch (Code JFP) or Facilities Engineering (Code FEF) in the development and implementation of water-quality mitigation measures, if necessary.

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### **16.8.3 Lead and Copper Monitoring Program**

To comply with the requirements of the Final Rule for Lead and Copper Action Levels (Title 40, Section 141 of the Code of Federal Regulations), the Environmental Office shall coordinate with the San Francisco Water Department (SFWD):

1. Conduct sampling for lead and copper to determine concentrations, as necessary.
2. Identify and prepare a health notice to persons who work in areas or buildings with lead and/or copper levels at or above the EPA action level.
3. Sample for lead and copper on at least a semiannual basis as part of Ames routine water-quality monitoring (see item 2 section 16.8.1).
4. Assist the Plant Engineering Branch in the development and implementation of lead and copper reduction measures where levels exceed the action levels.
5. Prepare standardized center notification and educational materials regarding lead and copper in drinking water.

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### **16.8.4 Backflow Prevention and Cross-Connection Control Programs**

To comply with the requirements of Title 17, Sections 7583-7605 of the California Code of Regulations, the Plant Engineering Branch, with assistance from the Environmental Office, shall:



1. 1. Adopt operating rules to implement backflow prevention and cross-connection control programs.
2. 2. Test all backflow-prevention devices at least annually.
3. 3. Maintain records of all device locations, annual test results, and repairs.

The Facilities Engineering Branch shall , with assistance from the Environmental Office, shall:

1. Conduct a survey to identify cross connections:
  - Interview building contacts regarding water uses.
  - Conduct building walk-throughs.
  - Inventory existing backflow prevention devices:
    - Note equipment related to backflow prevention devices or potential cross connections.
    - Note degree of hazard associated with water uses.
  - Propose corrective actions.
2. Prepare a cost estimate to complete backflow-prevention-device installation and system repair, and provide it to Code J and DQ management.
3. Install or modify backflow-prevention devices at potential cross connections, as identified in the survey. Possible problem areas include:
  - Lack of backflow-prevention devices where required.
  - Use of backflow-prevention devices inappropriate for level of hazard.
  - Improper installation of approved backflow-prevention devices.
  - Improper plumbing that may result in potential cross connections.

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### **16.8.5 Emergency Contingency Plan**

The emergency contingency plan identifies the actions necessary for Ames to prepare for and conduct emergency operations to ensure delivery of a safe water supply to the users during disaster events (fires, earthquakes, flooding, power outages, etc.). The Plant Engineering Branch, with assistance from the Environmental Office, shall:

1. Designate responsible personnel with clear chain of command and responsibilities.
2. Maintain an inventory of system resources:
  - Maps and diagrams showing locations of drinking water distribution system.
  - Emergency resources:
  - Emergency equipment and supplier.
  - Emergency contract agreements.

- Emergency water interconnections.

3. Develop and maintain a communication network:

- Designate locations for emergency operations centers and assign responsible personnel.
- Maintain an emergency contact list with equipment and water suppliers.
- Coordinate with governmental agencies for emergency, health, and safety protection and technical assistance.
- Maintain contact numbers for designated personnel of state and county health departments, fire and police departments, and hospitals.
- Develop plan for Center notification to water users regarding:
  - Emergency supply sources.
  - Necessary health protection/water disinfection measures.
  - Conservation measures.
  - Status of supply, repair, and restoration of service.
  - Emergency procedures.
- Implement an action plan according to the following list to maximize the use of reduced human and equipment resources and activate emergency supply interconnections, equipment acquisition, and repairs:
  - Assess damage to water system and components.
  - Analyze logistics on emergency supply activation and repairs.
  - Repair and restore supply service.
  - Monitor progress of repairs and restoration.
  - Communicate with health officials and water users on supply status.
  - Document damage/repairs.

4. Service Restoration

- Resume normal operations.
- Prepare and submit reports to appropriate agencies.

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## 16.9 Metrics

- % Compliance with water quality monitoring requirements.  
Goal: 100%
- % Complaints and Investigations conducted within 30 days of receipt.  
Goal: 100%

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## 16.10 Sources Of Additional Information Or Assistance

1. Environmental Office [REDACTED]
2. Environmental Office (WWW Home Page at <http://q.arc.nasa.gov>).

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## 16.11 Legionella Management Policies, Procedures, and Practices, Appendix A

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