



## **Alternate Water Source System Operations and Maintenance Manual Template (2018 version)**

Section 9b of the Rules and Regulations governing San Francisco Health Code Article 12C provides specific requirements regarding the Operations and Maintenance Manual which must be kept on premises and in other locations specified in the manual. The manual shall be reviewed annually and updated as appropriate. The manual shall include specific sections as described in the Rules and Regulations.

The following instructions/template is intended to aid 12C Permit Applicants in writing an Alternate Water Source System Operations and Maintenance Manual. *Example wording or directions on the type of information to provide is shown in blue italics* and should be modified or supplemented as appropriate.

*Please delete this page prior to submitting your O&M manual.*

Alternate Water Source System Operations and Maintenance Manual

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*<Insert Project Name>*  
*<Insert Project Address>*

Responsible Party/Permittee:  
*<Insert Name>*  
*<Insert Company Name>*  
*<Insert Company Address>*

Prepared by:  
*<Insert Name>*  
*<Insert Company Name>*  
*<Insert Company Address>*

Date: *<Insert Date>*

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## 1. General

### a. Facility information

*[insert information to fill in the below as appropriate]*

Type of use: (commercial, residential, mixed)

Location:

Number of residents and number of residential units (if applicable)

Number of non-resident employees (if applicable)

Alternate Water Source: (e.g. rainwater, stormwater, foundation drainage, graywater, blackwater)

End Use: (e.g. irrigation, toilet flushing, cooling tower)

Brief system description: . (e.g. filters, disinfection, etc)

Makeup Water Supply (e.g. SFPUC Potable Connection with Air Gap)

Location of air gap(s) (e.g. X” above overflow line of graywater storage tank)

Location of other approved backflow prevention devices (e.g.)

Location of flow meter(s):

Location of sample port(s)

Storage tank size(s) and material(s) (e.g. listing type/material graywater storage tank; type/material finished water tank etc.)

### b. Operations and Maintenance Manual

This manual will be kept *[insert exact location(s) where the O&M manual will be stored and where a copy will be kept]*. This manual will be updated by the Treatment System Manager annually. Interim changes to emergency numbers or personnel will be noted in a dated addendum and strike-through on all copies of the manual.

## 2. Training and Personnel

### a. Names and contact information:

Responsible Party: *[insert name and contact information]*

Building Manager:

Treatment System Manager: *[insert name and contact information]*

Emergency Contact: *[insert name and contact information for 24-hr/day on call]*

Contracted Laboratory: *[insert name and contact information]*

Other Contracted Operation or Maintenance Personnel: *[insert name and contact information]*

Other Manufacturer warranty or service contract personnel: *[insert name and contact information]*

**b. Personnel Schedules:**

Days/Hours that a Building Manager will be onsite:

Days/Hours that Treatment System Manager will be onsite:

Description of Remote Operations:

**c. Minimum requirements for Treatment System Manager**

- The Treatment System Manager shall be required to meet the following requirements:
  - *[XX years of experience in wastewater system design, engineering, or operations;*
  - *XX years of experience in water treatment*
  - *XX years of experience as facilities engineer*
  - *Appropriate health and safety training*
  - *Relevant licenses or certifications*
  - *Educational requirements]*
- The Treatment System Manager will be trained to operate and troubleshoot the system by *[the design engineer, the system manufacturer, etc.]*.
- The Treatment System Manager will be trained on the public health consequences of treatment failures and cross-connection by *[the system manufacturer, SFDPH, SFPUC, taking cross-connection courses, etc.]*
- The Treatment System Manager will be trained on chain-of-custody procedures for water quality sampling.

**d. Training Requirements for Other Personnel**

- Building operations, maintenance, and custodial staff will receive the following training:
  - *Appropriate health and safety training*
  - *Appropriate uses of non-potable water and the public health consequences of cross-connection control.*
  - *Appropriate procedures for building maintenance and cleaning to minimize impacts to the alternate water source system*
- Building management will ensure any plumbers working on the building are trained on the public health consequences of cross-connection control.

### **3. Alternate Water Source System Operations**

**a. Treatment Process Operations**

*[Describe how each treatment process will be operated, including:*

- *Acceptable treatment performance reliability and triggers for shutdown or other operator intervention*
- *Procedures for setting chemical feed rates and triggers for adjusting feed rates*
- *Identifying when backwash and equipment cleaning is required and identifying the procedure]*

**b. Instrumentation and alarms**

*[Describe the instrumentation, including:*

- *Instruments used*
- *Instrumentation calibration and maintenance schedule including*
  - *Regular calibration of continuous monitoring equipment.*
  - *Scheduled service intervals for process and monitoring equipment*
- *Instrumentation calibration and maintenance procedures*
- *Alarms (identify where alarms are monitored)]*

**c. Chemicals**

*[Describe the chemicals used including:*

- *Storage methods and safe handling practices*
- *Procedures for maintaining chemicals or reagents with expiration dates*

## **4. Compliance Monitoring Plan**

**a. Treatment System Monitoring**

*[Identify monitoring schedule for each monitored parameter, including monitoring methods and locations. Example: Turbidity levels will be measured continuously with an online turbidimeter. Daily minimum, maximum, and average turbidity will be recorded]*

**b. Pathogen Reduction Compliance**

*[Identify the means to verify that pathogen reduction requirements are being met]*

**c. Water Quality Sampling**

*[Identify sampling frequency, sampling procedures, and location]*

Water quality sampling frequency: *[insert parameters that are monitored via grab sample]*

Location(s) of sampling port(s): *[insert location(s) of sampling port(s)]*

Sampling procedures: *[ Weekly and monthly samples will be collected by the treatment system manager and delivered within 24 hours to the certified laboratory utilizing chain of custody procedures and forms as required by the laboratory. Copies of the procedure are included in Appendix D]*

## **5. Maintenance, inspection and schedule**

**a. Routine Maintenance:**

- i. Filters** *[e.g. replacement frequency, backwash intervals]*
- ii. Disinfection process** *[e.g. frequency of inspection, required chemicals or maintenance]*
- iii. Handheld monitoring equipment** *[e.g. frequency of calibration, frequency and type of cleaning, logging and recording equipment inspection]*

- iv. **Plumbing components** [e.g. checking for leaks, recording maintenance]
- v. **Cistern** [e.g. annual cleaning and disinfection]
- vi. **Etc.** [insert here other components or system operational considerations ]

**b. Recordkeeping** {describe where and how records are maintained}

**c. Triggers for Unscheduled Maintenance**

**d. Special Management Processes for Cooling Towers** (see Appendix A)

## 6. Provisions for monitoring and managing failure of treatment processes;

### a. Troubleshooting

*Example wording: “Troubleshooting of the system is managed through the control panel, located on-site. In most cases, if the system is malfunctioning, an alarm will be activated, and staff on-site should access the control panel to address the situation and take appropriate action. When the control panel door is closed, the main screen will alert staff which system component is malfunctioning.”*

### b. Potential system issues and responses

*[Example table below should be expanded and modified to include all appropriate issues, potential causes, and troubleshooting steps]*

**Table 1: System Troubleshooting**

Issue	Location	Potential Cause	Troubleshooting Steps
High Water	<cistern 1>	pump failure float malfunction excessive water input	Check pump Manually check cistern Manually check collection areas Ensure overflow and bypass functions are operating <i>Etc.</i>
Low Water	<Break tank>	Leaking Low water input Failure of backup water supply Treatment skid malfunction	
Low Water	<Cistern>	Pump failure Float malfunction Low water input	

Disinfection	<UV unit>	Lamp breakage
<i>Etc.</i>		
<i>Etc.</i>		

**c. Contingency Plan for Inadequately Treated Water**

*[Identify the procedure for preventing the delivery of inadequately treated water to the use area. Identify procedures in the event that inadequately treated water IS delivered to the use area, including how users and the public will be notified.]*

**7. Supplemental Water Supply**

**a. Make-up Water Supply Description**

Description: *[e.g. SFPUC Municipal Supply or SFPUC Municipally Supplied Reclaimed Water]*

Quality: *[e.g. Potable or Title 22 disinfected tertiary recycled quality]*

Quantity available: *[e.g. 1,000 gpd]*

Mode of delivery: *[e.g. via air gap to break tank]*

**b. Cross Connection and Backflow Prevention Measures**

1. Approved air gap location:
2. Other backflow device location(s)
3. Initial shutdown test date:  
Next shutdown test due four years after the initial shutdown test date

**c. Flow Diversion**

Table 2 shows anticipated circumstances when treated or untreated alternate water would be diverted to sewer and make-up water would be utilized:

**Table 2: Flow Diversion Conditions**

<b>Conditions Requiring Diversion</b>	<b>Notification</b>	<b>Diversion Procedures Action</b>
Low Chlorine	<e.g. auto-alarm>	<e.g. check chlorine supply and automation; increase chlorine dose>
Filter malfunction	<e.g. auto-alarm>	<e.g. backwash filter or replace>
Power failure	<e.g. facility notification>	<e.g. anticipate duration and switch to backup power source or wait until power is restored>
Etc.....		



## **8. Public Access and Impact**

All operations of the Alternate Water Source System will ensure that there is no human contact with the untreated Alternate Water Source. The operation of each component of the treatment process train ensures the safety of building occupants and visitors. Signage will be installed where the collection tank and treatment skid are located and at the point of use. Copies of the signage used on this property; outreach materials provide to the building occupants and the public; and procedures for ordering additional materials are provided in Appendix F.

*[Add additional information about protecting the public and visitors from exposure to untreated water or other risks associated with the onsite Alternate Water Source System]*

**Appendix A - Special Management Processes for Cooling Towers**

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The following Water Management Plan will prevent the growth of legionella and other bacteria in the cooling tower system:

- a. Recordkeeping** *[describe where and how records are maintained]*
- b. Location** *[describe where the cooling tower is located in relation to nearby HVAC intake fans or other equipment or receptors of concern]*
- c. Drift eliminators** *[describe type and installation locations of drift eliminators and schedule for inspection and maintenance]*
- d. Start-up and shutdown** *[describe procedures for start-up and shutdown that do not introduce microbial contaminants and ensure maintenance of unfavorable microbial growth conditions]*
- e. Disinfection and treatment** *[describe treatment including chemical doses/concentrations to prevent and control microbial growth]*
- f. Monitoring** *[describe frequency and type of water quality parameters measured; procedures for monitoring the control measures; and methods for recording inspection]*
- g. Corrective actions** *[describe procedures if known or suspected legionellosis is associated with the building water system; criteria for when and where samples for Legionella should be collected and analyzed; procedures for emergency disinfection; other actions to prevent exposure to contaminated cooling tower water]*

***Appendix B - Manufacturer Cut Sheets and O&M Manuals***

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***Appendix C - Equipment Service Contracts***

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**Appendix D - Water Quality Sampling Procedures**

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*[Provide the following sample forms:*

- *Water quality sampling procedures, including use of duplicates, replicate, blank, and spiked samples.*
- *Chain of Custody Procedures*
- *Copy of Contract with Certified Laboratory (if not already provided)*
- *Sample Contract Laboratory forms, such as Chain-of-Custody]*

**Appendix E - Sample Forms**

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*[Provide the following sample forms:*

- *Sample water treatment surveillance and monitoring data sheets*
- *Sample Discharge Monitoring Report Form and spreadsheet*
- *Sample log sheet for maintenance, including instrumentation calibration]*

**Appendix F - User and Public Information**

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*[Provide copies of the following as well as the contact information and procedures for ordering additional signage, pamphlets, etc:*

- *Use Area Signage*
- *Treatment and Maintenance Area Signage*
- *Pamphlets, and/or other educational materials that inform users of non-potable water usage and provide best practices to ensure system reliability. ]*