



## **San Francisco Department of Public Health**

### **Director's Rules and Regulations Regarding the Operation of Alternate Water Source Systems**

*August 2017*

#### **Authority**

Article 12C of the San Francisco Health Code established Permitting requirements for the use of alternate water sources and set Permit and annual fees. The San Francisco Department of Public Health (SFDPH) is authorized to perform duties associated with regulating the internal uses of Alternate Water Source Systems through its general authority to provide for the preservation, promotion, and protection of the health of the inhabitants of the City and County [San Francisco Charter Sec.4.110]. Additionally, Articles 11 and 12A of the City's Health Code authorize SFDPH Environmental Health Branch (SFDPH-EH) to investigate and abate any nuisance, activity, or condition that the SFDPH-EH deems to be a threat to public health and safety, and to investigate and abate any cross-connection risks between municipally supplied potable water, alternate water source systems, and sanitation systems in both public and private facilities. The Health Code authorizes the SFDPH-EH to order a person to vacate property, cease prohibited activities, abate unsafe or unsanitary conditions, and pay penalties for violations.

#### **Role**

The San Francisco Department of Public Health is the permitting agency for the operation of Alternate Water Source Systems in Residential Buildings containing three or more dwelling units, in Mixed-use and Non-residential Buildings, and where Alternate Water Source Systems are shared across property lines or in multiple structures. SFDPH-EH is responsible for ensuring that Alternate Water Source Systems are in compliance with applicable laws. SFDPH-EH performs ongoing monitoring, review, and inspections of permitted Alternate Water Source Systems to ensure such compliance is maintained.

## Table of Contents

1.	Definitions .....	3
2.	Allowed Alternate Water Sources .....	6
3.	Allowed Uses.....	7
4.	SFDPH Permit Requirements.....	7
5.	System Design Requirements .....	11
6.	Water Quality Requirements.....	13
7.	Monitoring, Sampling, Reporting and Notification Requirements .....	24
8.	Recordkeeping .....	28
9.	Treatment System Operation, Maintenance and Equipment.....	28
10.	Special Requirements for District-Scale Alternate Water Source Systems .....	29
11.	Variances and Permit Modifications.....	31
12.	Enforcement.....	32

## List of Tables

Table 1: Make-up Supply and Cross Connection Protection.....	12
Table 2: Water Quality Requirements for Blackwater Treatment Systems.....	14
Table 3: Water Quality Requirements for Graywater Treatment Systems.....	16
Table 4: Water Quality Requirements for Foundation Drainage Treatment Systems.....	18
Table 5: Water Quality Requirements for Stormwater Treatment Systems.....	20
Table 6: Water Quality Requirements for Rainwater Treatment Systems.....	21
Table 7: Volatile Organic Compound (VOC) Limits .....	22
Table 8: Example Treatment Process Log Reduction Credits .....	24
Table 9: Example Treatment Process Monitoring.....	25
Table 10: Routine Reporting Frequency.....	27

## 1. Definitions

**Air Gap:** A physical break between a supply pipe and a receiving vessel as set forth in the California Plumbing Code, Chapter 6, Section 603.

**Alternate Water Source:** A source of Non-Potable Water that includes Graywater, Rainwater, Stormwater, Foundation Drainage, Blackwater and/or any other source approved by the Director.

**Alternate Water Source System or Non-potable Water System:** The system of facilities necessary for providing Non-potable Water for use in a Development Project, including but not limited to all collection, treatment, storage, and distribution facilities.

**Alternate Water Source System Engineering Report or Non-potable Engineering Report (Engineering Report):** Report submitted by Project Applicant to the Director describing the Alternate Water Source System in accordance with these Rules and Regulations.

**Annual License Fee:** License fee paid annually to the Tax Collector pursuant to as provided in the San Francisco Business and Tax Regulations Code Section 249.24.

**As-Builts:** Final as-built architectural drawings.

**Blackwater:** Wastewater containing bodily or other biological wastes, as from toilets, dishwashers, kitchen sinks and utility sinks.

**Certified Laboratory:** An environmental testing laboratory certified by the California Environmental Laboratory Accreditation Program or the National Environmental Laboratory Accreditation Program (NELAP). Laboratories must be certified to perform each test for which they are providing results.

**Continuous Verification Monitoring or Continuous Monitoring:** Ongoing confirmation of system performance using sensors for continuous observation of selected parameters, including surrogate parameters that are correlated with pathogen log reduction target requirements.

**Development Project:** Construction of new buildings as defined in Section 12C.2 of Health Code Article 12C.

**Director:** The Director of the San Francisco Department of Public Health or any individual designated by the Director to act on his or her behalf, including, but not limited, to health inspectors.

**Discharge Monitoring Report (DMR):** A report documenting the operation and water quality results of an Alternate Water Source System permitted under these Rules and Regulations.

**Disinfection:** A physical or chemical process, including but not limited to, ultraviolet radiation, ozonation, and chlorination that is used for removal, deactivation or killing of pathogenic microorganisms.

**District-scale Project:** A Development Project entailing the sharing of an Alternate Water Source System serving two or more parcels or for use in multiple structures, whether under the jurisdiction of one entity or several.

**Enforceable Legal Agreement:** A legally enforceable agreement defining the roles and responsibilities of each property owner or entity acting as a Permittee, Supplier, or User of an Alternate Water Source System.

**First Flush Diverter:** A device operated by mechanical float valves or other types of automatic control that diverts a quantity of Rainwater collected from a surface following the onset of a rain event. Rainwater systems for subsurface or surface non-spray irrigation seeking to qualify for a permit exemption must have a first flush diverter that does not require manual operation, followed by a 100 µm filter or better.

**Foundation Drainage:** Nuisance groundwater that is extracted to maintain a building's or facility's structural integrity and would otherwise be discharged to the sanitary sewer system. Foundation Drainage does not include non-potable groundwater extracted for a beneficial use that is subject to City groundwater well regulations.

**Graywater:** Untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. Graywater includes, but is not limited to, wastewater from bathtubs, showers, bathroom sinks, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers.

**Human Contact Water Use:** A use of water which has the potential for human exposure by breathing or by direct contact with skin or eyes. Human Contact Water Uses include, but are not limited to, toilet flushing, spray irrigation, and cooling towers.

**Instructions for Alternate Water Source System Annual Reports:** Instructions, form or template developed by the Director identifying and describing the required elements of the Alternate Water Source System Annual Report.

**Instructions for Alternate Water Source System Engineering Reports:** Instructions, form or template developed by the Director identifying and describing the required elements of the Alternate Water Source System Engineering Report.

**Log Reduction:** The removal of a pathogen or surrogate in a unit process expressed in log units. A 1-log reduction equates to 90-percent removal, 2-log reduction to 99-percent removal, 3-log reduction to 99.9-percent removal, and so on.

**Log Reduction Credit:** The log reduction value (LRV) credited by SFDPH-EH to a treatment technology based the technology's ability to remove or inactivate pathogens and proposed surrogate parameter for continuous monitoring.

**Log Reduction Target (LRT):** The log reduction target for the specified pathogen group (i.e., viruses, bacteria, or protozoa) to achieve the agreed level of risk to individuals (e.g.,  $10^{-4}$  infection per year).

**Mixed-use Building:** A building containing both dwelling units and other Non-residential spaces.

**Multi-family Building:** A Residential Building containing three or more dwelling units.

**Non-Potable Water:** Non-potable water collected from alternate water sources, treated, and intended to be used on the Project Applicant's site or District parcels and is suitable for direct

beneficial use. Non-potable water is not of drinking water quality, but may still be used for many other purposes, depending on its quality.

**Non-residential Building:** A building that contains occupancies other than dwelling units.

**Operations and Maintenance Manual:** Document providing comprehensive information on the Alternate Water Source System operation, maintenance, and repair.

**Permit:** Permit to operate an Alternate Water Source System issued and enforced by SFDPH.

**Permittee:** The Person(s) who holds a valid permit granted by the Director to operate an Alternate Water Source System, and his or her agents, employees, and others acting at his or her direction. The Permittee is the Responsible Party as defined in Section 12C.2 of Health Code Article 12C. The Permittee is responsible for maintaining a permit, assuring that water collection, treatment, use, and water quality monitoring and reporting are consistent with the approved engineering report, the Operations and Maintenance Manual, these Rules and Regulations, and applicable state and local laws. A Permittee may also be the Supplier and/or User.

**Person:** Any natural person, corporation, sole proprietorship, partnership, association, joint venture, limited liability corporation, or other legal entity.

**Project Applicant:** The Person(s) or entity(s) applying for initial authorization to install an Alternate Water Source System. The Project Applicant is the Responsible Party as defined in Section 12C.2 of Health Code Article 12C. The Project Applicant is responsible for applying for the permit, assuring that the Alternate Water Source System is installed consistent with the approved Engineering Report, the Operations and Maintenance Manual, these Rules and Regulations, and applicable state and local laws. The Project Applicant becomes the Permittee upon issuance of the first Permit to operate.

**Rain Event:** For the purposes of informing the Director's decision on the length of the Initial System Start-up Period during system startup for Rainwater and Stormwater sourced systems, each Rain Event is the occurrence of precipitation in an amount exceeding 0.50 inches reported at the National Weather Service San Francisco station (SFOC1), or other applicable location as determined by the Director, preceded and followed by a minimum of 1 hour where less than 0.05 inches precipitation are reported.

**Rainwater:** Precipitation collected from roof surfaces or other manmade, above ground collection surfaces. Hydrocarbon-based fuels, hazardous materials, or fertilizers are prohibited to be stored or used on such surfaces.

**Residential Building:** A building that contains only dwelling units.

**SFDBI-PID:** San Francisco Department of Building Inspection, Plumbing Inspection Division

**SFDPH-EH:** San Francisco Department of Public Health, Environmental Health

**SFPUC:** San Francisco Public Utilities Commission

**SFPW:** San Francisco Public Works Department

**Site Supervisor:** In a District-scale Project, the qualified person or entity designated by a User and/or a Supplier to oversee the operation and maintenance of the on-site distribution system

and/or collection system and act as a liaison to the Treatment System Manager and/or Permittee.

**Spray irrigation:** A method of applying water for beneficial use by plants where the water emits from a fixture or device into the air before coming into contact with the soil, ground or plant surface.

**Stormwater:** Precipitation collected from at-grade or below grade surfaces or from any surface where hydrocarbon-based fuels, hazardous materials, or fertilizers are stored or used shall also be categorized as stormwater.

**Subsurface irrigation:** A method of applying water for beneficial use by plants where the water is delivered beneath the soil surface.

**Supplier:** An entity that supplies an untreated Alternate Water Source to the Alternate Water Source System for treatment and reuse. A Supplier may also be a Permittee and/or User.

**Surface non-spray irrigation:** A method of applying water for beneficial use by plants where the water is delivered directly at the ground plane via hardware such as a drip emitters or soaker hoses.

**Surrogate Parameter:** A measurable physical or chemical property that has been demonstrated to provide a direct correlation with the concentration of an indicator compound, can be used to monitor the efficiency of trace organic compounds removals by a treatment process, and/or provide indication of a treatment process failure.

**Treatment System Manager:** The qualified person or entity responsible for the daily management and oversight of the Alternate Water Source System. The Treatment System Manager may also be the Permittee or an entity contracted by the Permittee.

**User:** An entity that accepts treated water from an Alternate Water Source System for beneficial purposes within its area of occupancy. A User may also be a Permittee and/or Supplier.

**Validation Report:** Report documenting a detailed technology evaluation study that was conducted to challenge the treatment technology over a wide range of operational conditions. The validation report shall include evidence of the treatment technology's ability to reliably and consistently achieve the log reduction value, including information on the required operating conditions and surrogate parameters that require continuous monitoring.

## 2. Allowed Alternate Water Sources

Collection, storage and/or treatment and subsequent reuse of the following alternate water sources may be permitted under these Rules and Regulations:

- Rainwater
- Stormwater
- Graywater
- Foundation Drainage
- Blackwater

Other alternate sources of water may be considered if approved under the variance procedure described in **Section 11**.

### 3. Allowed Uses

The following uses may be permitted under these Rules and Regulations:

- Indoor Reuse
  - Toilet and urinal flushing
  - Priming drain traps
  - Clothes washing
- Outdoor Reuse
  - Subsurface irrigation
  - Drip or other surface non-spray irrigation
  - Spray irrigation
  - Decorative fountains and impoundments
  - Cooling applications
  - Dust control/street cleaning

Other uses of Alternate Water Sources may be allowed if approved under the variance procedure described in **Section 11**.

### 4. SFDPH Permit Requirements

A permit from SFDPH-EH is required for the operation of Alternate Water Source Systems at Multi-family Buildings, Mixed-use Buildings, and Non-residential Buildings with the following four exceptions:

- Permit Exception 1: Rainwater systems having a first flush diverter and a 100 µm filter which are used solely for subsurface irrigation or for surface non-spray irrigation;
- Permit Exception 2: Graywater systems used solely for subsurface irrigation;
- Permit Exception 3: Foundation Drainage systems used solely for subsurface irrigation.
- Permit Exception 4: Stormwater systems used solely for subsurface irrigation.

The above four types of Alternate Water Source Systems do not require a permit under San Francisco Health Code Article 12C.

The Director shall issue a Permit to the Project Applicant after all applicable requirements in these Rules and Regulations are met. A Permit to operate will be valid for one year from the date of issuance. Permits must be renewed annually by the Permittee as specified in this Section.

Systems being operated without a valid Permit shall be subject to penalty.

#### a. Permit Application

The following are required elements for an Alternate Water Source System Permit application:

**Water Budget Application:** Project Applicants shall submit a Water Budget Application for review and approval by the General Manager of the SFPUC. The Water Budget Application shall include a description and location of the proposed or existing Alternate

Water Source System, the project's water budget, and other applicable information. The Water Budget Application must identify all User(s) and Supplier(s) data.

**Application for a Permit and Fee:** Project Applicants shall submit an Application for a Permit to Operate an Alternate Water Source System (Permit Application) to the Director accompanied by the appropriate fee as shown in the SFDPH-EH schedule of fees. District-scale Projects may be charged an additional hourly rate for permit application review and approval.

**Engineering Report Approval:** Project Applicants shall submit an Alternate Water Source System Engineering Report (Engineering Report) to the Director for review and approval. The Engineering Report shall be prepared by a qualified engineer licensed in California and experienced in the field of wastewater treatment, and shall include all items in the Instructions for Alternate Water Source System Engineering Reports. The Engineering Report will not be reviewed unless and until all appropriate fees have been paid to SFDPH-EH. The Director may request revisions to initial and subsequent Engineering Report submittals. The Director shall make reasonable efforts to provide a response to project applicants within 30 days of receipt of an initial or revised Engineering Report.

**Required Documents:**

- If the Alternate Water Source System differs in any way from the approved Engineering Report, the Project Applicant must submit an updated Engineering Report to SFDPH-EH. Any modifications to the system are subject to review and approval by the Director.
- A finalized Operations and Maintenance Manual that complies with the requirements set forth in **Section 9** of these Rule and Regulations;
- An affidavit signed by the designated Treatment System Manager that verifies knowledge, skills, abilities and training to operate the permitted system;
- Evidence of a contract with a certified laboratory to perform water quality analysis;
- System construction verification provided to SFDPH-EH on company letterhead, signed and stamped by qualified engineer licensed in California stating that the Alternate Water Source System was constructed in accordance with the approved Engineering Report, professionally certified plans, specifications and applicable sections of state and local code. SFDPH-EH may request to be present during system construction verification; and
- Evidence of satisfactory performance upon cross connection wet-test overseen by certified personnel from the San Francisco Public Utilities Commission Water Quality Division or other certified personnel as determined by the Director;

**Enforceable Legal Agreement (for District-scale Projects only):** Project Applicants for District-scale Projects shall provide to the Director an executed legally Enforceable Legal Agreement defining the roles and responsibilities of each property owner or entity with regard to the Alternate Water Source System. The Permittee and each of the Suppliers and Users shall be included in, and signatories to the agreement. The agreement shall be recorded.



## b. Permit Issuance

After the system is installed and all required elements and procedures in these Rules and Regulations are completed and approved by the Director, SFDPH-EH will issue a Permit for the Operation of the Alternate Water Source System to the Permittee. The Permit requires compliance with all requirements of these Rules and Regulations, and will require increased monitoring and reporting frequencies in the Conditional Startup Mode before the Final Use Mode is granted.

### **Conditional Startup Mode Permit:**

The Conditional Startup Mode allows for an initial system start-up period to operate the Alternate Water Source System and confirm the system is performing per the approved Engineering Report and pursuant to the requirements of Article 12C.

**Duration:** The duration of the Conditional Startup Mode period shall be 180 days, unless the Director determines that a shorter or longer start-up period will best serve the public health. The Conditional Startup Mode allows for field verification of the alternate water source system treatment processes, instrumentation, water quality sampling, etc. The Conditional Startup Mode period may be extended for an additional 90 days by the Director.

**Monitoring and Reporting:** During the Conditional Startup Mode period, applicable surrogate parameters shall be monitored and water samples shall be analyzed by a Certified Laboratory at the applicable frequencies required in **Sections 6 – 7**. The Treatment System Manager shall submit results of laboratory analysis along with a completed and signed Discharge Monitoring Report to SFDPH-EH at the frequencies required in **Sections 6 – 7**.

**Bypass Conditions:** During Conditional Startup Mode, the alternate water source shall be treated and diverted to the sanitary sewer. All fixtures in the building shall be operated using the municipally supplied make-up water source. The Director may allow rainwater treatment systems to forego or end bypass conditions prior to the end of the Conditional Startup Mode upon written approval.

During Conditional Startup Mode, systems must comply with all requirements of the permit as set forth in these Rules and Regulations.

### **Final Use Mode Permit and Ongoing Permit Conditions**

**Duration:** Upon completion of the Conditional Startup Mode period, the Director will revise the Permit to Final Use Mode. The Final Use Mode applies as long as all permit conditions and requirements are met.

**Monitoring and Reporting:** During Final Use Mode, applicable surrogate parameters shall be monitored and water samples shall be analyzed by a Certified Laboratory as applicable. at the frequencies required in **Sections 6 – 7**. The Treatment System Manager shall submit results of laboratory analysis along with a completed and signed Discharge Monitoring Report to SFDPH-EH at the frequencies required in **Sections 6 – 7**. Subject to the treatment processes utilized in the Alternate Water Source System, it may be possible to minimize or eliminate water quality sampling requirements after the Conditional Startup Mode

by continuously monitoring treatment system performance via surrogate parameters as detailed in **Sections 6 – 7**.

Applicable sampling, analysis and reporting requirements must be continually met for the permit to remain valid.

During Final Use Mode, systems must comply with all requirements of the permit as set forth in these Rules and Regulations.

**Bypass Conditions:** All Alternate Water Source Systems shall immediately divert the alternate water source to the sanitary sewer system upon receipt of the results of any water quality test sample that does not meet the water quality requirements of the Permit or indication of a process malfunction based on continuous monitoring. Systems required to divert to the sanitary sewer may resume normal operation after the Director receives and approves documentation of three (3) consecutive days of full compliance along with a letter explaining why the performance was compromised and what actions were taken to prevent it from reoccurring.

#### c. Permit Renewal

Every Permittee shall renew their Permit annually by paying to the Office of the Treasurer and Tax Collector of the City and County of San Francisco the annual License fee set forth in Section 249.24 of the San Francisco Business and Tax Regulation Code. Upon the failure of the Permittee to pay such fees, the Permit shall be considered null and void until the Permittee pays the fees and any penalties that might be assessed by the Director.

The Alternate Water Source System Permit shall be considered null and void if it is determined that the system was built without applicable building and plumbing permits issued by the SFDBI, and, where applicable, encroachment permits issued by Department of Public Works.

#### d. Permit Modification

The Director may order the modification of any Permit issued under these Rules and Regulations upon: (1) a written application from the Permittee or (2) receipt of evidence that the operation may (A) violate any provisions of these Rules and Regulations or (B) endanger the public health.

Changes to the Alternate Water Source System, including but not limited to changes in source water, end uses, treatment or other system components, may require permit modification.

In a District scale Project, the Director may order the modification of any Permit issued under these regulations given any changes in the roles of Supplier, Permittee, and or User as submitted to the Director.

Except where the Permittee requests Permit modification, if the Director determines that a Permit issued under these Rules and Regulations is required to be modified, the Director shall serve such order on the Permittee, either by personal service or by certified mail return receipt requested, and the modification shall be effective and final thirty (30) days after the service of such order unless appealed by the Permittee. Within

thirty (30) days from the service of the order, the Permittee may appeal the modification order to the Director. The Director shall conduct an administrative hearing upon the filing of an appeal by the Permittee in accordance with **Section 12**.

Alternate Water Source System Permittees will be charged an hourly rate for review and approval of permit modifications.

#### e. Permit Transfer

Permits to operate Alternate Water Source Systems are not automatically transferable. New owners must submit documentation that they can and will properly operate an Alternate Water Source System. The Director may approve or deny the transfer of a permit. The system may not be operated in absence of a current Permit. Permit transfer requests require written application to the Director.

A new SFPUC Water Budget Application is not required in order to request a Permit transfer for an existing system in which construction and operation are consistent with a previously accepted Engineering Report.

### 5. System Design Requirements

#### a. Cross Connection Control and Make-up Water Supply

Cross connection testing shall be completed in accordance with Article 12A of the San Francisco Health Code and the California Plumbing Code prior to initial operation of the system and at intervals thereafter as mandated.

The municipal water connection serving properties with alternate water source systems must be protected by a containment Reduced Pressure Principle Backflow Prevention Device (RP) within 25 feet downstream of the point of connection or water meter to protect the City's public water and/or recycled water system.

As shown in Table 1, Alternate Water Source Systems must include municipally supplied make-up water **via an air gap** except:

- Make-up Water Supply Exception 1: Irrigation-only systems are not required to include a municipally supplied make-up;
- Make-up Water Supply Exception 2: Rainwater harvesting systems that do not specify an isolation air-gap at the point of municipally supplied make-up may alternatively specify an isolation RP at the point of potable make-up to the Alternate Water Source System.

**Table 1: Make-up Supply and Cross Connection Protection**

	<b>Rainwater Source Systems</b>	<b>All other Alternate Water Sources</b>
Municipally supplied make-up water source <sup>1</sup>	Required	Required
Service Meter Protection	Containment RP <sup>2</sup> required <25 ft. downstream of municipally supplied water service meter	Containment RP required <25 ft. downstream of municipally supplied water service meter
Protection at the point of municipally supplied make-up to the Alternate Water Source System	Isolation air gap OR Isolation RP	Isolation air gap
<b>Notes:</b>		
1. Irrigation-only systems are not required to include a municipally supplied make-up.		
2. RP = Reduced Pressure Principle Backflow Prevention Device		

**b. Fail-Safe Mechanisms**

All systems must be equipped with features that result in a controlled and non-hazardous automatic shutdown of the process in the event of a malfunction.

**c. Flow Meter**

All properties collecting, treating, receiving, or distributing water from an Alternate Water Source System shall include a flow meter on the treated Alternate Water Source distribution system and a flow meter on the potable make-up water pipeline to the Alternate Water Source System.

**d. Overflow**

All properties collecting, treating, receiving, or distributing water from an Alternate Water Source System shall include overflow connections to the sanitary sewer system with an air gap or other approved backflow prevention device.

**e. California Plumbing Code Compliance**

All properties collecting, treating, receiving, or distributing water from an Alternate Water Source System shall include components or design features as required by the California Plumbing code, specifically:

- (1) Signage as required by the California Plumbing Code; signage shall be maintained in good condition and free from damage or removal;
- (2) For rainwater systems, a first flush diverter or debris excluder as required by the California Plumbing Code;
- (3) Tanks that receive and/or store untreated graywater and/or blackwater shall be properly vented per the California Plumbing Code.

**f. Irrigation System Requirements**

Alternate Water Source Systems providing non-potable water for irrigation purposes shall be designed and operated in accordance with the following:

- The treatment, storage, distribution, reuse, or discharge of Alternate Water Sources shall not create a nuisance.
- Treated Alternate Water Sources shall not be applied to designated irrigation areas during periods when soils are saturated and could lead to runoff.
- Treated Alternate Water Sources shall not be allowed to escape the designated irrigation areas as surface flow or spray that would either pond and/or enter surface waters.
- Irrigation spray or runoff caused by irrigation shall not enter a dwelling or food handling facility, and shall not contact any drinking water fountain, unless specifically protected with a shielding device.

#### g. Cooling Application Requirements

Alternate Water Source Systems using treated blackwater in conjunction with an air conditioning facility, utilizes a cooling tower, or otherwise creates a mist that could come into contact with employees, members of the public, or building occupants, the cooling system shall comply with the following:

- A drift eliminator shall be used whenever the cooling system is in operation.
- A chlorine or other biocide shall be used to treat the cooling system recirculating water to minimize the growth of Legionella and other microorganisms.

### 6. Water Quality Requirements

A Project Applicant shall design and operate an Alternate Water Source System such that the Alternate Water Source receives treatment that achieves the water quality requirements in this Section.

#### a. Blackwater Treatment Systems

Blackwater must be oxidized, filtered, and disinfected prior to use for non-potable applications. Blackwater treatment systems shall meet the water quality requirements established in Table 2.

- Oxidized effluent means an alternate water source that has been stabilized, is nonputrescible, and contains dissolved oxygen.
- Filtered effluent means an oxidized effluent that has passed through a media filter or microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane to meet established turbidity requirements.
- Disinfected effluent means oxidized and filtered effluent that has been disinfected to meet the established pathogenic microorganism control requirements.
  - Pathogenic microorganism control for virus and protozoa is achieved by meeting log reduction targets in Table 2.
  - Pathogenic microorganism control for bacteria is achieved by meeting requirements in Table 2. Total coliform sampling shall be conducted at least once daily when the treatment plant is in operation. The samples shall be taken from the disinfected effluent and shall be analyzed by a certified laboratory.
- For blackwater treatment systems utilizing ultraviolet light (UV) disinfection:
  - The design UV dose shall be at least 80mJ/cm<sup>2</sup>.
  - The filtered effluent UV transmittance shall be 65 percent or greater.

**Table 2: Water Quality Requirements for Blackwater Treatment Systems**

Parameter	Water Quality Limit	Monitoring Frequency
BOD <sub>5</sub>	<ul style="list-style-type: none"> <li>The maximum concentration shall not exceed 25 mg/L at any time; and</li> <li>The average concentration shall not exceed 10 mg/L utilizing the results of the last 4 weeks for which analyses have been completed (Start-Up).</li> </ul>	Weekly, Monthly <sup>1</sup>
TSS	<ul style="list-style-type: none"> <li>The maximum concentration shall not exceed 30 mg/L at any time; and</li> <li>The average concentration shall not exceed 10 mg/L utilizing the results of the last 4 weeks for which analyses have been completed (Start-Up).</li> </ul>	Weekly, Monthly <sup>1</sup>
Virus	<p>Treatment must achieve at least:</p> <ul style="list-style-type: none"> <li>8.5-log reduction in enteric virus for indoor reuse OR</li> <li>8.0-log reduction in enteric virus for outdoor reuse.</li> </ul>	Continuously (via surrogate parameter(s))
Protozoa	Treatment must achieve at least 7.0-log reduction in parasitic protozoa.	Continuously (via surrogate parameter(s))
Bacteria <sup>2</sup>	<p>Meet the Total Coliform requirements listed below:</p> <ul style="list-style-type: none"> <li>The median concentration shall not exceed an MPN of 2.2 /100 mL utilizing the bacteriological results of the last seven days for which analyses have been completed; and</li> <li>The maximum number shall not exceed an MPN of 23 /100 mL in more than one sample in any 30 day period; and</li> <li>No sample shall exceed an MPN of 240 /100 ml at any time.</li> </ul>	Daily
Turbidity	<p>For media filter:</p> <ul style="list-style-type: none"> <li>The median concentration shall not exceed 2 NTU within a 24-hour period;</li> <li>The maximum shall not exceed 5 NTU more than 5 percent of the time within a 24-hour period; and</li> <li>No sample shall exceed 10 NTU at any time.</li> </ul> <p>For membrane filter:</p> <ul style="list-style-type: none"> <li>The maximum shall not exceed 0.2 NTU more than 5 percent of the time within a 24-hour period; and</li> <li>No sample shall exceed 0.5 NTU at any time.</li> </ul>	Continuously
Chlorine Residual	Over any 24-hour period, the average chlorine residual shall be within the range 0.5 – 2.5 mg/L.	Continuously
pH	At all times, the pH shall be between 6 and 9.	Weekly
Odor	The system shall not emit offensive odors.	n/a
Flow	At least one flow meter must be installed.	Continuously
<p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>Systems shall be sampled weekly for BOD and TSS during the Conditional Startup Mode period, after which monthly sampling shall be performed. Based on the results, the Director may reduce the frequency of sampling as described in Section 11 of these Rules and Regulations.</li> <li>Pathogenic microorganism control for bacteria is achieved by complying with water quality limits for total coliform. Total coliform sampling shall be conducted at least once daily when the treatment plant is in operation. The samples shall be taken from the disinfected effluent and shall be analyzed by a certified laboratory.</li> </ol>		

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## b. Graywater Treatment Systems

Graywater must be oxidized, filtered, and disinfected prior to use for non-potable applications. Graywater treatment systems shall meet the water quality requirements established in Table 3.

- Oxidized effluent means an alternate water source that has been stabilized, is nonputrescible, and contains dissolved oxygen.
- Filtered effluent means an oxidized effluent that has passed through a media filter or microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane to meet established turbidity requirements.
- Disinfected effluent means oxidized and filtered effluent that has been disinfected to meet the established pathogenic microorganism control requirements.
  - Pathogenic microorganism control for virus and protozoa is achieved by meeting log reduction targets in **Table 3**.
  - Pathogenic microorganism control for bacteria is achieved by complying with water quality limits for total coliform. Total coliform sampling shall be conducted daily during the Conditional Startup Mode. Based on the results, the Director may reduce the frequency of total coliform sampling during Final Use Mode or may allow surrogate parameter monitoring for systems that can meet log reduction targets as specified in **Table 3**.

**Table 3: Water Quality Requirements for Graywater Treatment Systems**

Parameter	Water Quality Limit	Monitoring Frequency
BOD <sub>5</sub>	<ul style="list-style-type: none"> <li>The maximum concentration shall not exceed 25 mg/L at any time; and</li> <li>The average concentration shall not exceed 10 mg/L utilizing the results of the last 4 weeks for which analyses have been completed (Start-Up).</li> </ul>	Weekly, Monthly <sup>1</sup>
TSS	<ul style="list-style-type: none"> <li>The maximum concentration shall not exceed 30 mg/L at any time; and</li> <li>The average concentration shall not exceed 10 mg/L utilizing the results of the last 4 weeks for which analyses have been completed (Start-Up).</li> </ul>	Weekly, Monthly <sup>1</sup>
Virus	Treatment must achieve at least: <ul style="list-style-type: none"> <li>6.0-log reduction in enteric virus for indoor reuse OR</li> <li>5.5-log reduction in enteric virus for outdoor reuse.</li> </ul>	Continuously (via surrogate parameter(s))
Protozoa	Treatment must achieve at least 4.5-log reduction in parasitic protozoa for all end use applications.	Continuously (via surrogate parameter(s))
Bacteria <sup>2</sup>	Treatment must achieve at least 3.5-log reduction in enteric bacteria  AND/OR  meet the Total Coliform requirements listed below: <ul style="list-style-type: none"> <li>The median concentration shall not exceed an MPN of 2.2 /100 mL utilizing the bacteriological results of the last seven days for which analyses have been completed; and</li> <li>The maximum number shall not exceed an MPN of 23 /100 mL in more than one sample in any 30 day period; and</li> <li>No sample shall exceed an MPN of 240 /100 ml at any time.</li> </ul>	Continuously (via surrogate parameter(s))  Daily, Other <sup>2</sup>
Turbidity	For media filter: <ul style="list-style-type: none"> <li>The median concentration shall not exceed 2 NTU within a 24-hour period;</li> <li>The maximum shall not exceed 5 NTU more than 5 percent of the time within a 24-hour period; and</li> <li>No sample shall exceed 10 NTU at any time.</li> </ul> For membrane filter: <ul style="list-style-type: none"> <li>The maximum shall not exceed 0.2 NTU more than 5 percent of the time within a 24-hour period; and</li> <li>No sample shall exceed 0.5 NTU at any time.</li> </ul>	Continuously
Chlorine Residual	Over any 24-hour period, the average chlorine residual shall be within the range 0.5 – 2.5 mg/L.	Continuously
pH	At all times, the pH shall be between 6 and 9.	Weekly
Odor	The system shall not emit offensive odors.	n/a
Flow	At least one flow meter must be installed.	Continuously
<b>Notes:</b>		
<ol style="list-style-type: none"> <li>Systems shall be sampled weekly for BOD and TSS during the Conditional Startup Mode period, after which monthly sampling shall be performed. Based on the results, the Director may reduce the frequency of sampling as described in Section 11 of these rules and regulations.</li> <li>Pathogenic microorganism control for bacteria is achieved by complying with water quality limits for total coliform. Total coliform sampling shall be conducted daily during the Conditional Startup Mode. Based on the results, the Director may reduce the frequency of total coliform sampling during Final Use Mode or may allow surrogate parameter monitoring for systems that can meet the specified log reduction targets as described in Section 11 of these rules and regulations. If total coliform testing sampling frequency is reduced to weekly or less, the maximum number shall not exceed an MPN of 2.2 /100 mL or additional sampling will be required.</li> </ol>		



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### c. Foundation Drainage Treatment Systems

Foundation drainage treatment systems shall meet the water quality requirements established in **Table 4**.

- Pathogenic microorganism control for virus and protozoa is achieved by meeting log reduction targets in **Table 4**.
- Pathogenic microorganism control for bacteria is achieved by complying with water quality limits for total coliform. Total coliform sampling shall be conducted weekly during the Conditional Startup Mode. Based on the results, the Director may reduce the frequency of total coliform sampling during Final Use Mode or may allow surrogate parameter monitoring for systems that can meet log reduction targets as specified in **Table 4**.

**Table 4: Water Quality Requirements for Foundation Drainage Treatment Systems**

Parameter	Water Quality Limit	Monitoring Frequency
Virus	Treatment must achieve at least: <ul style="list-style-type: none"> <li>• 3.5-log reduction in enteric virus for indoor reuse OR</li> <li>• 3.0-log reduction in enteric virus for outdoor reuse.</li> </ul>	Continuously (via surrogate parameter(s))
Protozoa	Treatment must achieve at least: <ul style="list-style-type: none"> <li>• 3.5-log reduction in parasitic protozoa for indoor reuse OR</li> <li>• 2.5-log reduction in parasitic protozoa for outdoor reuse.</li> </ul>	Continuously (via surrogate parameter(s))
Bacteria <sup>1</sup>	Treatment must achieve at least: <ul style="list-style-type: none"> <li>• 3.0-log reduction in enteric bacteria for indoor reuse OR</li> <li>• 2.0-log reduction in enteric bacteria for outdoor reuse</li> </ul> <p>AND/OR</p> <p>meet the Total Coliform requirements listed below:</p> <ul style="list-style-type: none"> <li>• No sample shall exceed an MPN of 2.2 /100 ml at any time or additional sampling will be required.</li> </ul>	Continuously (via surrogate parameter(s))  Weekly, Other <sup>1</sup>
Turbidity	For media filter: <ul style="list-style-type: none"> <li>• The median concentration shall not exceed 2 NTU within a 24-hour period;</li> <li>• The maximum shall not exceed 5 NTU more than 5 percent of the time within a 24-hour period; and</li> <li>• No sample shall exceed 10 NTU at any time.</li> </ul> <p>For membrane filter:</p> <ul style="list-style-type: none"> <li>• The maximum shall not exceed 0.2 NTU more than 5 percent of the time within a 24-hour period; and</li> <li>• No sample shall exceed 0.5 NTU at any time.</li> </ul>	Continuously
Chlorine Residual	Over any 24-hour period, the average chlorine residual shall be within the range 0.5 – 2.5 mg/L.	Continuously
VOCs	See <b>Table 7</b>	Quarterly
Odor	The system shall not emit offensive odors.	n/a
Flow	At least one flow meter must be installed.	Continuously
<b>Notes:</b>		
1. Pathogenic microorganism control for bacteria is achieved by complying with water quality limits for total coliform. Total coliform sampling shall be conducted weekly during the Conditional Startup Mode. Based on the results, the Director may reduce the frequency of total coliform sampling during Final Use Mode or may allow surrogate parameter monitoring for systems that can meet the specified log reduction targets as described in Section 11 of these Rules and Regulations.		

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#### d. Stormwater Treatment Systems

Stormwater treatment systems shall meet the water quality requirements established in **Table 5**.

- Pathogenic microorganism control for virus and protozoa is achieved by meeting log reduction targets in **Table 5**.
- Pathogenic microorganism control for bacteria is achieved by complying with water quality limits for total coliform. Total coliform sampling shall be conducted weekly during the Conditional Startup Mode. Based on the results, the Director may reduce the frequency of total coliform sampling during Final Use Mode or may allow surrogate parameter monitoring for systems that can meet log reduction targets as specified in **Table 5**.

**Table 5: Water Quality Requirements for Stormwater Treatment Systems**

Parameter	Water Quality Limit	Monitoring Frequency
Virus	Treatment must achieve at least: <ul style="list-style-type: none"> <li>• 3.5-log reduction in enteric virus for indoor reuse OR</li> <li>• 3.0-log reduction in enteric virus for outdoor reuse.</li> </ul>	Continuously (via surrogate parameter(s))
Protozoa	Treatment must achieve at least: <ul style="list-style-type: none"> <li>• 3.5-log reduction in parasitic protozoa for indoor reuse OR</li> <li>• 2.5-log reduction in parasitic protozoa for outdoor reuse.</li> </ul>	Continuously (via surrogate parameter(s))
Bacteria <sup>1</sup>	Treatment must achieve at least: <ul style="list-style-type: none"> <li>• 3.0-log reduction in enteric bacteria for indoor reuse OR</li> <li>• 2.0-log reduction in enteric bacteria for outdoor reuse</li> </ul> <p>AND/OR</p> <p>meet the Total Coliform requirements listed below: No sample shall exceed an MPN of 2.2 /100 ml at any time or additional sampling will be required.</p>	Continuously (via surrogate parameter(s))  Weekly, Other <sup>1</sup>
Turbidity	For media filter: <ul style="list-style-type: none"> <li>• The median concentration shall not exceed 2 NTU within a 24-hour period;</li> <li>• The maximum shall not exceed 5 NTU more than 5 percent of the time within a 24-hour period; and</li> <li>• No sample shall exceed 10 NTU at any time.</li> </ul> <p>For membrane filter:</p> <ul style="list-style-type: none"> <li>• The maximum shall not exceed 0.2 NTU more than 5 percent of the time within a 24-hour period; and</li> <li>• No sample shall exceed 0.5 NTU at any time.</li> </ul>	Continuously
Chlorine Residual	Over any 24-hour period, the average chlorine residual shall be within the range 0.5 – 2.5 mg/L.	Continuously
VOCs	See <b>Table 7</b>	Quarterly <sup>2</sup>
Odor	The system shall not emit offensive odors.	n/a
Flow	At least one flow meter must be installed.	Continuously
<b>Notes:</b>		
<ol style="list-style-type: none"> <li>1. Pathogenic microorganism control for bacteria is achieved by complying with water quality limits for total coliform. Total coliform sampling shall be conducted weekly during the Conditional Startup Mode. Based on the results, the Director may reduce the frequency of total coliform sampling during Final Use Mode or may allow surrogate parameter monitoring for systems that can meet the specified log reduction targets as described in Section 11 of these Rules and Regulations.</li> <li>2. The Director may reduce the frequency of VOC monitoring for stormwater systems that show consistent evidence of minimal risk of contamination by VOCs through monitoring results and/or demonstration of low risk stormwater collection environment.</li> </ol>		

## e. Rainwater Treatment Systems

Rainwater treatment systems shall meet the water quality requirements established in **Table 6**.

- Disinfection with chlorine, ozone, ultraviolet radiation, or other approved agent is required for all uses with potential for human contact.
- Pathogenic microorganism control for bacteria is achieved by complying with water quality limits for total coliform. Total coliform sampling shall be conducted weekly during the Conditional Startup Mode. Based on the results, the Director may reduce the frequency of total coliform sampling during Final Use Mode or may allow surrogate parameter monitoring for systems that can meet log reduction targets as specified in **Table 6**

**Table 6: Water Quality Requirements for Rainwater Treatment Systems**

Parameter	Water Quality Limit	Monitoring Frequency
Bacteria <sup>1</sup>	Treatment must achieve at least 3.5-log reduction in enteric bacteria  AND/OR  meet the Total Coliform requirements listed below: <ul style="list-style-type: none"> <li>• No sample shall exceed an MPN of 2.2 /100 ml at any time or additional sampling shall be required.</li> </ul>	Continuously (via surrogate parameter(s))  Weekly, Other <sup>1</sup>
Turbidity	For media filter: <ul style="list-style-type: none"> <li>• The median concentration shall not exceed 2 NTU within a 24-hour period;</li> <li>• The maximum shall not exceed 5 NTU more than 5 percent of the time within a 24-hour period; and</li> <li>• No sample shall exceed 10 NTU at any time.</li> </ul> For membrane filter: <ul style="list-style-type: none"> <li>• The maximum shall not exceed 0.2 NTU more than 5 percent of the time within a 24-hour period; and</li> <li>• No sample shall exceed 0.5 NTU at any time.</li> </ul>	Continuously
Odor	The system shall not emit offensive odors.	n/a
Flow	At least one flow meter must be installed.	Continuously
<p><b>Notes:</b></p> <p>1. Pathogenic microorganism control for bacteria is achieved by complying with water quality limits for total coliform. Total coliform sampling shall be conducted weekly during the Conditional Startup Mode. Based on the results, the Director may reduce the frequency of total coliform sampling during Final Use Mode or may allow surrogate parameter monitoring for systems that can meet the specified log reduction targets as described in Section 11 of these Rules and Regulations.</p>		

## f. Volatile Organic Compounds

The volatile organic compounds (VOCs) identified in **Table 7** shall be monitored as described in **Table 4** and **Table 5**.

**Table 7: Volatile Organic Compound (VOC) Limits**

VOC	Unacceptable Concentration (mg/L) <sup>1</sup>
Benzene	0.1
Carbon Tetrachloride	0.5
1,2-Dichlorobenzene	5.4
1,4-Dichlorobenzene	5.4
1,1-Dichloroethane	14.4
1,2-Dichloroethane	0.1
1,1-Dichloroethylene	0.1
cis-1,2-Dichloroethylene	28.4
trans-1,2-Dichloroethylene	28.4
Dichloromethane	3.1
1,2-Dichloropropane	12.6
1,3-Dichloropropene	0.2
Ethylbenzene	15.6
Methyl-tert-butyl ether	5.2
Monochlorobenzene	1.7
Styrene	7.7
1,1,2,2-Tetrachloroethane	0.3
Tetrachloroethylene	6.1
Toluene	6.8
1,2,4-Trichlorobenzene	1.4
1,1,1-Trichloroethane	68.2
1,1,2-Trichloroethane	1.6
Trichloroethylene	4.8
Trichlorofluoromethane	201.1
1,1,2-Trichloro-1,2,2-Trifluoroethane	272.9
Vinyl Chloride	0.1
Xylenes	15.6
<b>Notes:</b>	
1. SFDPH-EH derived estimated unacceptable concentrations of VOC's from the U.S. Occupational Safety and Health Administration Permissible Exposure Limits for 8-hour inhalation exposures to selected VOCs.	

## g. Pathogenic Microorganism Control Log Reduction Credits

To meet the pathogenic microorganism control requirements for enteric virus and parasitic protozoa, Project Applicants must install treatment processes that achieve log reduction targets as shown in **Table 2** through **Table 6**.

Pathogenic microorganism control for bacteria is achieved by complying with water quality limits for total coliform.

- For blackwater, total coliform sampling shall be conducted at least once daily when the treatment plant is in operation as shown in **Table 2**.
- For all other alternate water sources, total coliform sampling shall be conducted at frequencies shown in **Table 3** through **Table 6** during the Conditional Startup Mode. The Director may reduce the frequency of total coliform sampling during Final Use Mode or may allow surrogate parameter monitoring for systems that can meet log reduction targets as shown in **Table 3** through **Table 6**.

**Log Reduction Credits.** SFDPH-EH grants log reduction credits based on each technology's ability to achieve a defined log reduction value. Evidence of the treatment technology's ability to reliably and consistently achieve the log reduction value, including information on the required operating conditions and surrogate parameters that require continuous monitoring, must be included in a Project Applicant's Engineering Report.

For treatment technologies that submit validation reports as evidence for log reduction credits, the submitted validation reports must include a letter demonstrating the report has been accepted previously by the California Division of Drinking Water.

**Table 8** provides example log reduction credits for different treatment processes and examples of required supporting information. **Table 8** is not prescriptive or exhaustive as specific requirements will be approved by SFDPH-EH based on details provided by the Project Applicant in the Engineering Report.

**Continuous Monitoring.** A project applicant shall propose and include in its Engineering Report, continuous monitoring, as described in **Section 7**, using the pathogenic microorganisms of concern or a microbial, chemical, or physical surrogate parameter(s) that verifies the performance of each treatment process's ability to achieve its credited log reduction.

**Table 8: Example Treatment Process Log Reduction Credits**

Treatment Process	Available Log Reduction Credits Virus/Protozoa/Bacteria	Example Information to be Included in an Engineering Report <sup>1</sup>
Microfiltration or Ultrafiltration	0/4/0	Description and calculation of how the system defines an acceptable pressure decay test value per the EPA's Membrane Filtration Guidance Manual to detect 3.0 µm breach
Membrane Biological Reactor (MBR)	1.5/2/4	Operation with the Tier 1 operating envelope as defined in the AWRCE, <i>Membrane bio-reactor</i> , WaterVal validation protocol <sup>2</sup>
Reverse Osmosis	Up to 2/2/2 (Dependent on surrogate parameter)	Manufacturer's information indicating ability to reject sodium chloride and description of/rationale for surrogate parameter used to calculate log removal credits
Ultraviolet (UV) Light Disinfection	Up to 6/6/6 (Dose Dependent)	UV reactor's Validation Report following state-approved procedures <sup>3</sup> or NSF/ANSI 55 Class A validated.
Chlorine Disinfection	Up to 5/0/0 (CT dependent)	Calculations demonstrating CT disinfection, where CT = Concentration of Chlorine x Contact Time and specifics on how concentration and contact time will be determined
Ozone Disinfection	Up to 4/3/0 (CT dependent)	Calculations demonstrating CT disinfection, where CT = Concentration of Ozone x Contact Time and specifics on how concentration and contact time will be determined

**Notes:**

1. The information presented herein is for informational purposes. Specific requirements will be approved by SFDPH-EH based on details provided by the Project Applicant in the Engineering Report.
2. AWRCE, *Membrane bio-reactor*, WaterVal validation protocol, Australian Water Recycling Center of Excellence (AWRCE), Brisbane.
3. UV log reduction credits are reactor-specific and dose dependent. UV Validation Reports shall be prepared by a licensed engineer. Validation reports must provide evidence of reactor's ability to reliably and consistently achieve the log reduction value, including information on the required operating conditions and surrogate parameters that require continuous monitoring. The Validation Report shall document results based on validation testing completed utilizing one of the following:
  - a. EPA UV Disinfection Guidance Manual (USEPA 2006),
  - b. German UV Devices for the Disinfection for Drinking Water Supply Standard (DVGW 2006), or
  - c. NWRI UV Disinfection: Guidelines for Drinking Water and Water Reuse, 3rd edition (NWRI 2012)
Submitted validation reports must include a letter demonstrating the report has been accepted previously by the California Division of Drinking Water.

## 7. Monitoring, Sampling, Reporting and Notification Requirements

### a. Continuous Monitoring:

Continuous monitoring is required as indicated in **Table 2** through **Table 6**. This includes flow meters, turbidimeters, and other instrumentation as needed to demonstrate compliance with pathogenic microorganism control.



For treatment processes that are used to meet a log reduction target, each treatment process shall have continuous monitoring using the pathogenic microorganisms of concern or a microbial, chemical, or physical surrogate parameter(s) that verifies the performance of each treatment process's ability to achieve its credited log reduction. The Project Applicant shall propose and include in its Engineering Report, for SFDPH-EH review and approval, the type of continuous monitoring to be utilized and credited log reduction will be determined based on the surrogate parameter utilized for continuous monitoring.

If a pathogen log reduction target, as shown in **Table 2** through **Table 6**, is not being met based on the continuous monitoring required, the Treatment System Manager shall notify the San Francisco Department of Public Health, Environmental Health (phone: 415-252-3800, email: [DPH.Nonpotable@sfdph.org](mailto:DPH.Nonpotable@sfdph.org)) in accordance with the Malfunction Notification requirements as included in these Rules and Regulations.

**Table 9** provides example continuous monitoring methods used for different treatment processes. is not prescriptive or exhaustive as specific requirements will be approved by SFDPH-EH based on details provided by the Project Applicant in the Engineering Report.

**Table 9: Example Treatment Process Monitoring**

Treatment Process	Example Continuous Monitoring Methods
Microfiltration or Ultrafiltration	<ul style="list-style-type: none"> <li>• Daily pressure decay test</li> <li>• Effluent Turbidity</li> </ul>
Membrane Biological Reactor (MBR)	<ul style="list-style-type: none"> <li>• Effluent Turbidity</li> </ul>
Reverse Osmosis	<ul style="list-style-type: none"> <li>• Influent and Effluent Total Organic Carbon (TOC)</li> <li>• Influent and Effluent Electrical Conductivity</li> </ul>
Ultraviolet Light Disinfection	<ul style="list-style-type: none"> <li>• Influent UV transmittance</li> <li>• Influent turbidity</li> <li>• UV intensity</li> <li>• Flow rate</li> </ul>
Chlorine Disinfection	<ul style="list-style-type: none"> <li>• Free chlorine residual</li> <li>• Flow rate</li> </ul>
Ozone Disinfection	<ul style="list-style-type: none"> <li>• Ozone residual</li> <li>• Flow rate</li> </ul>
<p><u>Notes:</u></p> <ol style="list-style-type: none"> <li>1. The information presented herein is for informational purposes. Specific requirements will be approved by SFDPH-EH based on details provided by the Project Applicant in the Engineering Report.</li> </ol>	

**b. Routine Sampling:**

**Table 2** through **Table 6** show water quality requirements and sampling frequencies; water sample locations will be based on the critical control point for each treatment process utilized. Permits issued under these Rules and Regulations will adhere to the water quality sampling and analysis requirements specified in **Table 2** through **Table 6** for the alternate source water and end use.

In general, monitoring is required quarterly, monthly, weekly, daily or continuously depending on the permit type, source and end use. The Director may modify Permit

requirements if evidence indicates that the modified requirements maintain public health protection. Subject to the treatment processes utilized in the Alternate Water Source System, it may be possible to minimize or eliminate water quality sampling requirements after the Conditional Startup Mode by continuously monitoring treatment system performance via surrogate parameters as detailed in **Sections 6 – 7**.

The Permittee shall ensure that all operational water quality sampling and reporting requirements are undertaken by a qualified entity as approved by the Director.

Where multiple water sources are combined, the monitoring requirements of the source with the most stringent monitoring requirements will apply.

Water samples must be analyzed by a Certified Laboratory using methods approved by the Environmental Protection Agency for water sampling and analysis, or through approved in-line monitoring devices as detailed in the Engineering Report. Laboratory reports must be signed by the laboratory director or a designee. Instrumentation with continuous monitoring capabilities must be installed when continuous monitoring is required.

SFDPH-EH may request to be present during required water quality sample collections.

#### **c. Routine Reporting:**

Testing results shall be reported via approved Discharge Monitoring Reports and be accompanied by data in an approved electronic format. A Discharge Monitoring Report form shall be provided by the Director. The information reported shall include:

- System treated water flow (gallons per day, gallons per week or gallons per month)
- Water quality characteristics in accordance with the Permit.
- Attachments describing any breakdowns, upsets, bypasses, odors, complaints, or other system operation anomalies.

Discharge Monitoring Reports shall be signed by the Permittee or Treatment System Manager and submitted by the 15th of the month following the last day of the period reported.

**Table 10** specifies reporting frequency for each type of Alternate Water Source Systems. In general, results from monitoring must be reported to SFDPH-EH on a monthly or annual basis, depending on the type of permit issued.

**Table 10: Routine Reporting Frequency**

<b>Alternate Water Source</b>	<b>Routine Reporting Frequency<sup>1</sup></b>
Blackwater	Monthly
Graywater	Monthly during Conditional Startup Mode, Annually thereafter <sup>2</sup>
Foundation Drainage	Monthly during Conditional Startup Mode, Annually thereafter <sup>2</sup>
Stormwater	Monthly during Conditional Startup Mode, Annually thereafter <sup>2</sup>
Rainwater <sup>3</sup>	Monthly during Conditional Startup Mode, Annually thereafter <sup>2</sup>
<b>Notes:</b>	
<ol style="list-style-type: none"> <li>Operational changes, system malfunctions, and/or monitoring results which are outside of the applicable water quality limits shall be reported within 24 hours.</li> <li>Reduced reporting frequency after Conditional Startup Mode is contingent on the Director's approval.</li> <li>Rainwater systems that are used for subsurface irrigation, drip irrigation, or non-spray surface irrigation and, at a minimum, include a first flush diverter, and a 100 µm filter, do not require water quality monitoring or reporting.</li> </ol>	

**d. Annual Report:**

The Permittee or Treatment System Manager shall submit an Annual Report to the Director by January 15, each year. The Annual Report shall include all items in the Instructions for Alternate Water System Annual Reports, and will describe compliance of the Alternate Water Source System with these Rules and Regulations and the limits and conditions established by the Permit.

The Annual Report shall be signed by the Treatment System Manager and the Permittee.

**e. Malfunction Notification:**

The Treatment System Manager shall notify the San Francisco Department of Public Health, Environmental Health (phone: 415-252-3800, email: DPH.Nonpotable@sfdph.org) of any malfunction that results in or is likely to result in environmental harm or increased public risk. Malfunctions may include, but are not limited to spills or overflows, unanticipated bypasses, or excursions outside of water quality limitations for any of the pollutants monitored.

Oral notification shall take place within 24 hours from the time the Treatment System Manager becomes aware of the circumstances and include, as applicable:

- A description of the malfunction, including location description
- If a spill or overflow occurred: estimated volume and description of receiving waters
- A description of any component involved in the malfunction
- A description of the suspected causes
- Planned diagnostic and/ or mitigation steps

- The estimated date and time when the malfunction or the effects of the malfunction began and stopped or will be stopped

Written notification shall occur within 5 days and include:

- The cause or suspected cause of the circumstance
- Steps taken or planned to reduce, eliminate, and prevent reoccurrence and a schedule of major milestones for those steps
- Steps taken or planned to mitigate the impacts(s) and schedule of the major milestones for those steps
- Public notification steps taken

#### f. Notification of Facility Changes and Other Circumstances:

The Permittee or Treatment System Manager shall notify the SFDPH-EH, SFDBI-PID, SFPW (if applicable), and SFPUC prior to any facility expansion, production increase, or process modification that is expected to result in a change in the character of the treated water.

The Permittee or Treatment System Manager shall notify all users immediately of any circumstance which indicates that treated water quality may not meet acceptable standards.

## 8. Recordkeeping

The Treatment System Manager shall maintain system records on premises and available for inspection by the Director, including but not limited to (1) Current Permit; (2) Current treatment system Operations and Maintenance Manual; (3) Signed results delivered by the Certified Laboratory and evidence of chain of custody; (4) Discharge Monitoring Reports; (5) Annual Reports; (6) Notifications as described in **Section 7**; (7) A log of all calibrations, maintenance, and major changes in operation; and (8) A log of all system auto-generated alarms, causes and corrective actions. Records shall be maintained for at least two years.

## 9. Treatment System Operation, Maintenance and Equipment

### a. Treatment System Manager Capacity

The Permittee shall directly employ or maintain a service contract with a Treatment System Manager(s) to supervise the operation of the Alternate Water Source System. The Treatment System Manager must:

- Be duly qualified to carry out the operation, maintenance, and monitoring requirements to assure continuous compliance with the conditions set forth in these Rules and Regulations.
- Sign an affidavit attesting that they possess sufficient knowledge, skills, abilities and training to operate the Alternate Water Source System.
- Must be certified as a Grade II Wastewater Treatment Plant Operator by the State Water Resources Control Board's Office of Operator Certification or by the California Water Environmental Association or have comparable education and/or experience to operate a blackwater or graywater source system.

The Permittee shall notify the Director in writing within thirty (30) days of replacement or re-designation of Treatment System Manager(s) responsible for supervising system

operation (including shifts). This requirement is in addition to other reporting requirements contained in these Rules and Regulations.

#### **b. Operations and Maintenance Manual**

A current Operations and Maintenance Manual 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 all items in the Instructions for Alternate Water System Operations and Maintenance Manuals, including but not limited to descriptions of the treatment system operations, instrumentation, water quality and monitoring reporting plan, troubleshooting, and emergency procedures.

Systems with any cooling tower end use shall also include a Cooling Tower Water Management Plan as an appendix to the Operations and Maintenance Manual. The purpose of the Cooling Tower Water Management Plan is to describe strategies for preventing the growth of *legionella* and other bacteria in the cooling tower system. Required elements of the Cooling Tower Water Management Plan shall include the following specific to the cooling tower end use: recordkeeping; location of the cooling tower in relation to nearby HVAC intake fans or other equipment or receptors of concern; description and maintenance schedule for drift eliminators; start-up and shutdown procedures; disinfection and treatment; procedures for monitoring control measures; and procedures that will be followed if known or suspected legionellosis is associated with the building water system.

#### **c. Equipment**

Equipment and instruments used to comply with the treatment and monitoring requirements set forth in these Rules and Regulations shall be calibrated, maintained, and operated consistent with manufacturer's recommendations.

### **10. Special Requirements for District-Scale Alternate Water Source Systems**

A District-scale Project entails the sharing of an Alternate Water Source System across two or more parcels or for use in multiple structures, whether under the jurisdiction of one entity or several. District-scale Projects are subject to additional permit requirements as outlined in this section.

#### **a. Enforceable Legal Agreement**

Project applicants for District-scale Projects shall provide to the Director an executed Enforceable Legal Agreement defining the roles and responsibilities of each property owner or entity in relation to the maintenance and use of the System. The Permittee and each of the Suppliers and Users shall be included in, and signatories of the agreement. The agreement shall be recorded.

#### **b. Special Requirements for Operations and Maintenance for District-scale Projects**

Suppliers, Permittees, and Users shall, at all times, properly operate and maintain all technologies and systems which are installed or used to achieve compliance with the Permit. All procedures shall be described in the Operations and Maintenance Manual.

The Permittee shall conduct periodic inspections of all facilities to monitor and assure compliance with conditions of the Permit. The Permittee shall take all necessary actions

to assure compliance as outlined in the Enforceable Legal Agreement, the Operations and Maintenance Manual, and these Rules and Regulations.

All properties where alternate water is collected, treated and/or used shall allow entry for inspection by the Permittee, Treatment System Manager, and SFDPH-EH and SFDBI-PID inspectors.

All Permittees, Treatment System Managers, Suppliers, and Users shall comply with these Rules and Regulations and other regulations regarding the use of alternate water sources and recycled water.

#### **c. Special Requirements for Notifications and Reporting for District-scale Projects**

The Permittee is responsible for all notifications including those which result from equipment failures or system malfunctions on properties which are owned and operated by other entities named in the Legally Enforceable Agreement.

The Permittee shall notify the SFDPH-EH, SFDBI-PID, SFPUC, and SFPW prior to termination of system operation by the Permittee, termination of the approved water source by the Supplier, and/or termination of the acceptance of treated water by a User.

#### **d. Special Requirements for Records and Documentation for District-scale Projects**

A copy of the Permit must be provided to all Suppliers and Users in a District-Scale system by the Permittee. The Permittee, Treatment System Manager, Suppliers, and Users must have the Permit available at all times for inspection by SFDPH-EH.

Copies of the current Operations and Maintenance Manual must be kept on premise where each component resides.

#### **e. Site Supervisor**

Each User and Supplier shall designate a Site Supervisor to oversee the operation and maintenance of the onsite distribution and or collection systems and act as a liaison to the Permittee or Treatment System Manager. The Site Supervisor must be an employee who is familiar with the plumbing system and available and be able to be reached by phone at all times. The User and or Supplier shall notify the Permittee immediately of replacement or re-designation of Site Supervisor(s). The Permittee shall notify the Director in writing within thirty (30) days of replacement or re-designation.

The Site Supervisor shall be adequately trained to operate and monitor all needed equipment to assure continuous compliance with the conditions set forth in these Rules and Regulations.

The Site supervisor is responsible for:

- Overseeing the maintenance of the collection and/or distribution system;
- Overseeing repairs and/or modifications to the plumbing/sprinkler system to ensure it remains in compliance with all regulatory requirements;
- Maintaining all signs, labels, and tags on system components;

- Acting as a liaison between the actual users of the treated alternate water source and the Treatment System Manager and SFDPH-EH;
- Understanding, and implementing emergency procedures and protocols; and
- Reporting system issues, non-functioning system components, and any other condition that jeopardizes public health and/or permit compliance as needed to the Treatment System Manager and SFDPH-EH.

#### f. Lockable Valves

All properties collecting, treating, receiving, or distributing water from an Alternate Water Source System shall include lockable valves which can be activated to control the flow of water from any source originating from another property and lockable valves which can be activated to control the flow of water to any user located at another property.

### 11. Variances and Permit Modifications

#### a. Water sources and/or end uses

The Director shall have the discretion to grant variances for additional water sources and end uses as set forth in **Sections 2** and **3**, provided that the project applicant provides the anticipated source water quality data and demonstrates that the treatment and end use are protective of public health. The Director shall determine the appropriate water quality criteria and ongoing monitoring and reporting. A request for variance shall be in writing and submitted to the Director.

#### b. Sampling requirements and reporting frequencies

The Director shall have the discretion to grant variances from the sampling requirements set forth in **Table 2** through **Table 6** and the reporting frequencies in **Table 10** provided that the project applicant demonstrates that strict interpretation of a standard would cause practical difficulties or unnecessary hardship due to special circumstances and/or that the requested variances do not pose a threat to the public health. A request for a variance shall be in writing and submitted to the Director. No variance shall be granted unless the Director finds that the requested variance is consistent with the purposes of these Rules and Regulations.

The Director shall have the discretion to amend the permit requirements for sampling requirements and reporting frequencies for blackwater systems on permits older than 1 year. Permit amendments require written application to the Director.

#### c. Legacy Systems

Applicability: This Section 11.c of these Rules and Regulations applies to Alternate Water Source Systems operated by Permittees or Project Applicants that, as of the date that these regulations governing Article 12C took effect, either:

- (1) Had a valid Permit issued by SFDPH-EH; or
- (2) Did not have a valid Permit but did have an approved Engineering Report

These projects will be considered "Legacy Systems". Permittees or Project Applicants to which this Section 11.c. applies have two options if their system design does not meet specific requirements of these Rules and Regulations for treatment and log removal targets. Note that Legacy Systems MUST comply with all other aspects of these Rules

and Regulations, including but not limited to: Treatment System Manager qualifications requirements, instrumentation for continuous monitoring of appropriate surrogate parameters, Operations and Maintenance Manual content and revision, and malfunction reporting requirements.

**Option 1: Ongoing monitoring option.**

Under Option 1, a Legacy System shall be required to demonstrate compliance with Article 12C through ongoing monitoring, sampling, laboratory analyses and reporting as specified by the Director and may be required to monitor for additional parameters such as protozoa or viruses.

Option 1 will be available to approved Legacy Systems until such time as the Director determines that best available technology options are feasible to implement.

**Option 2: Revision, reassessment and approval under the new rules**

Under Option 2, a Legacy System may make changes to the existing treatment design or instrumentation to conform with new requirements under these Rules and Regulations. Under Option 2, the Director will evaluate submittals and approve design or instrumentation changes consistent with requirements set forth in these Rules and Regulations. After approval under Option 2, projects will demonstrate continuing compliance with the law in accordance with all procedures in these Rules and Regulations.

## 12. Enforcement

### a. Inspection

SFDPH-EH retains the right to enter and inspect any Alternate Water Source System governed by these Rules and Regulations during normal business hours in the absence of advance notice. All properties included in a District-scale project are subject to inspection. All documentation required under these Rules and Regulations shall be made available for inspection on request.

### b. Suspension and Revocation of Permits

Any permit issued for an Alternate Water Source System may be revoked, or suspended by the Director, if the Director determines:

- The Treatment System Manager, or any employee has violated any provision of Article 12C or any regulation issued pursuant to Article 12C;
- The Permittee has engaged in any conduct in connection with the operation of the Alternate Water Source System that violates any State or local laws, or any employee of the Permittee has engaged in any conduct that violates any State or local laws while operating Alternate Water Source System, and the Permittee had or should have had actual or constructive knowledge by due diligence that the illegal conduct was occurring;
- The Permittee has engaged in any material misrepresentation when applying for a permit;
- The Alternate Water Source System is being managed, conducted, or maintained without regard for the public health, or the health of patrons and/or employees;



- The Permittee or any employee of the Permittee or any entity entered into a Legally Enforceable Agreement with the Permittee in a District-scale system has refused to allow any duly authorized City official to inspect the premises or the operations of the Alternate Water Source System; or
- Based on a determination by another City department, including the Department of Building Inspection, the Fire Department, the Police Department, and/or the Planning Department, that the Alternate Water Source System is not in compliance with any State or local laws.

The Director may not suspend or revoke a permit issued pursuant to Article 12C or take other enforcement action against the Permittee of an Alternate Water Source System until the Director has issued a notice of violation and provided the Permittee an opportunity to be heard and respond as provided in Section 12c of these Rules and Regulations. Notwithstanding, the Director may immediately suspend any permit issued under Article 12C pending a noticed hearing on revocation or suspension when in the opinion of the Director, the public health or safety requires such immediate suspension. Any affected Permittee or Treatment System Manager shall be given notice of such immediate suspension in writing delivered to the Permittee in person or by registered letter.

#### c. Violations and Administrative Penalties

The provisions of Chapter 100 of the San Francisco Administrative Code, as amended, shall govern the amount of administrative fines to be charged and the procedures for imposition, enforcement, collection, and administrative review of administrative citations issued to enforce Health Code Article 12C.

For purposes of this Rule, “charging official” shall mean the Director, or his or her designee, “violation” shall mean a violation of Article 12C or these Rules and Regulations, and “violator” shall mean the cited Alternate Water Source System Permittee.

Any Alternate Water Source System Permittee who violates any provision of Article 12C or any Rule or Regulation adopted pursuant to Article 12C may be subject to an administrative penalty not to exceed \$100 per day for the first violation of a provision or regulation in a 12-month period, \$200 per day for the second violation of the same provision or regulation in a 12-month period; and \$500 per day for the third and subsequent violations of the same provision or regulation in a 12-month period.

Citations will be served to both the Permittee and the Real Property owner in a manner consistent with Chapter 100 of the San Francisco Administrative Code. Payment of fines shall be directed to the San Francisco Department of Public Health Environmental Health Branch, 1390 Market Street, Suite 210, San Francisco, CA 94102.

#### d. Appeals

**Permit Decisions:** The final decision of the Director to grant, deny, suspend, or revoke a permit, as provided in Article 12C, may be appealed to the Board of Appeals in the manner prescribed in San Francisco Business and Tax Relations Code Article 1.

**Administrative Penalties:** The final decision of the Director to impose administrative penalties, as provided in Article 12C may be appealed in the manner described in Administrative Code Chapter 100.