



National Blue Ribbon Commission
for Onsite Non-potable Water Systems

A Guidebook for Developing and Implementing Regulations for Onsite Non-potable Water Systems

Model State Regulation

A large, decorative graphic at the bottom of the page consisting of overlapping curved shapes in various shades of blue, from light to dark, creating a sense of movement and depth.

How to Use This Template

This model state regulation was developed in conjunction with *A Guidebook for Developing and Implementing Regulations for Onsite Non-potable Water Systems*. Onsite non-potable water system (ONWS) programs can be developed and implemented through regulation at the state level, an ordinance at the local level, or a combination of the two. Pathways to implementation may look like:

- **States Develop Regulation, Local Authority Implements:** States establish regulation for the treatment, monitoring, and reporting requirements for ONWS. Local authorities establish oversight and management programs by adopting a local ordinance and accompanying rules.
- **States Develop Regulation and Implements:** States establish regulation for the treatment, monitoring, and reporting requirements for ONWS as well as provide oversight and management of ONWS.
- **Local Authority Develops Regulation and Implements:** Local authorities establish a local ordinance to regulate the treatment, monitoring, and reporting requirements for ONWS as well as provide all regulatory oversight.

The appropriate implementation structure will depend on the particular circumstances in each state and locality. The model state regulation provided here is based on the approach that the state develops the regulation and the local authority implements the oversight and management program that complies with the state regulation. However, it should be noted that the local ordinance can also stand alone as sufficient regulation in the absence of a state regulation. At the time of this publication, San Francisco, CA is the only jurisdiction that has developed and implemented a local ordinance to regulate ONWS.

A Guidebook for Developing and Implementing Regulations for Onsite Non-potable Water Systems, along with a model local ordinance, model program rules, and the appendix, can be downloaded at: <http://uswateralliance.org/initiatives/commission>.

Model State Regulation for Onsite Non-potable Water Systems

This model state regulation is to establish standards for treatment performance and monitoring and reporting requirements for onsite non-potable water systems (ONWS).

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Section SR.1 Purpose

- a. The purpose of the Regulation for Onsite Non-Potable Water Systems (Regulation) is to establish standards for treatment performance and monitoring, reporting, design, and operation requirements for onsite non-potable water systems (ONWS) that may collect rainwater, stormwater, graywater, and blackwater for non-potable reuse within and around buildings that will provide for protection of public health and the environment.
- b. The purpose of this Regulation is to identify the types of procedures included in local oversight of ONWS programs developed by local agencies to oversee and manage ONWS.
- c. It is the intent of this Regulation that all elements are to be interpreted in a manner that fully implements applicable state and federal water quality laws and regulations, in order to protect public health, enhance the environment, and put the waters of the state to the fullest use of which they are capable.

Section SR.2 Definitions

For the purposes of this Regulation, the following definitions shall apply:

Air Gap: a physical break between a supply pipe and a receiving vessel as set forth in the local or state plumbing code.

Alternate Water Source: a source of non-potable water that may include any of the following: graywater, roof runoff, stormwater, blackwater, and any other source approved by the state or local agency.

Blackwater: wastewater originating from toilets, urinals, and/or kitchen counters (e.g., kitchen sinks and dishwashers).

Certified Laboratory: an environmental testing laboratory certified by an accepted state accreditation program or the National Environmental Laboratory Accreditation Program. Laboratories must be certified to perform each test for which they are providing results.

Challenge Test: the evaluation of a unit treatment process for pathogen log₁₀ reduction performance using selected surrogate or indigenous constituents. In general, a surrogate is introduced to the process influent, and the process influent and effluent flow are monitored for the concentration of the surrogate.

Commercial Building: a building that is used for commercial purposes.

Continuous Verification 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.

Cross-connection: when a plumbing system allows water from one system (e.g., non-potable) to enter into another system (e.g., potable), resulting in the contamination of potable water.

District-Scale Project: an ONWS for a defined service area that covers two or more properties and may cross public rights-of-way.

Domestic Wastewater: wastewater collected from residential uses.

Field Verification: performance confirmation study conducted using challenge testing, including surrogate microorganisms and/or other non-biological surrogates, usually during startup and commissioning and may be repeated as needed. The need for, duration, and extent of the field verification procedure will depend on characteristics of the ONWS.

Graywater: wastewater collected from non-blackwater sources, such as bathroom sinks, showers, bathtubs, clothes washers, and laundry sinks.

Incidental Runoff: unintended small amounts (volume) of runoff from ONWS irrigation use areas, such as unintended, minimal over-spray that escapes the ONWS irrigation use area. Water leaving an ONWS irrigation use area is not incidental if it is part of the facility design, due to excessive application, intentional overflow or application, or negligence.

Indoor Use: toilet and urinal flush water and clothes washing.

Local Agency: any city, county, town, parish, or city and county with the jurisdictional authority to permit use of ONWS.

Log₁₀ Reduction: the removal of a pathogen or surrogate in a unit process expressed in log₁₀ units. A 1-log reduction equates to 90% removal, 2-log reduction to 99% removal, 3-log reduction to 99.9% removal, and so on.

Log₁₀ Reduction Target (LRT): the log₁₀ reduction target for the specified pathogen group (e.g., viruses, bacteria, or protozoa) to achieve the identified level of risk to individuals (e.g., 10⁻⁴ infection per year).

Mixed-use Building: a building that contains residential and commercial uses.

Multi-family Building: a residential building containing three or more dwelling units.

Multi-user Building: any building that is not a single residence (e.g., multi-residential apartment, commercial, mixed-use, and others).

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-scale project and is suitable for direct beneficial use.

Onsite Non-potable Water System (ONWS): a system in which water from local sources is collected, treated, and used for non-potable uses at the building to district/neighborhood-scale, generally at a location near the point of generation.

ONWS Engineering Report (Engineering Report): report submitted by project applicant to the local agency describing the ONWS in accordance with the program rules adopted by the local agency.

Operations and Maintenance Manual: document providing comprehensive information on the ONWS operation, maintenance, and repair.

Permit: permit to operate an ONWS issued and enforced by the state or local agency.

Permittee: the person(s) who holds a valid permit granted by the state or local agency to operate an ONWS. 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, the program rules, and applicable state and local laws. A permittee may also be the supplier and/or user.

Project Applicant: the person(s) or entity(s) applying for authorization to install and use an ONWS. The project applicant is responsible for applying for the permit, assuring that the ONWS is installed consistent with the approved engineering report, the operations and maintenance manual, the program rules, and applicable state and local laws. The project applicant becomes the permittee upon issuance of the first permit to operate.

Residential Building: a building that contains only dwelling units.

Roof Runoff: precipitation from rain or snowmelt events that is collected directly from a roof surface not subject to frequent public access.

State Agency: the state agency with legal authority to administer and/or provide oversight to local agencies seeking to implement programs that allow for ONWS.

Stormwater: precipitation runoff from rain or snowmelt events that flows over land and/or impervious surfaces (e.g., streets and parking lots). Stormwater also includes runoff from roofs with frequent public access.

Supplier: an entity that supplies an untreated alternate water source to the ONWS for treatment and reuse. A supplier may also be a permittee and/or user.

Treatment System Manager: the qualified person or entity responsible for the daily management and oversight of the ONWS.

Unrestricted Irrigation: irrigation of ornamental plants (e.g., non-food) and dust suppression.

User: an entity that accepts treated water from an ONWS 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.

Section SR.3 Allowed Alternate Water Sources for ONWS

The following alternate water sources may be used to supply an ONWS:

- a. Roof Runoff
- b. Stormwater
- c. Graywater

- d. Domestic Wastewater or Blackwater

Section SR.4 Allowed Non-potable End Uses

The following non-potable end uses may be met by an ONWS:

- a. Indoor Use:
 - i. Toilet and urinal flushing
 - ii. Clothes washing
- b. Unrestricted Irrigation:
 - i. Ornamental plant irrigation
 - ii. Dust suppression

Section SR.5 Allowed Implementation Scale

This Regulation is limited to ONWS that serve the following implementation scales:

- a. Multi-Family Buildings
- b. Commercial Buildings
- c. Mixed-Use Buildings
- d. District-Scale Projects

This Regulation does not apply to ONWS that serve a single residential dwelling.

Section SR.6 State Agency Responsibilities and Duties

- a. The State Agency has the principle responsibility of establishing mandatory treatment performance standards and monitoring and reporting requirements in an adopted Regulation for use by local agencies in local programs to protect public health and the environment.
- b. As the State Agency charged with the development and adoption of this Regulation, the State Agency shall periodically review, amend and/or update this Regulation as required.
- c. *[Optional Element]* The State Agency may take any action assigned to the local agency in this Regulation in the event that the local agency fails to establish locally authorized program.
- d. *[Optional Element]* The State Agency may require local agencies to periodically report to the State with respect to implementation of local programs.
- e. *[Optional Element]* Primary responsibility for enforcement of this part shall be with the local agency. Nothing in this part shall prevent the State Agency from taking any enforcement actions to protect public health. The State Agency shall provide training

and technical assistance to the local agencies to ensure uniform enforcement of this part.

Section SR.7 Local Agency Responsibilities and Duties

- a. A local agency may authorize ONWS for the express purposes set forth in this Regulation as long as the local agency has adopted a local program through a local ordinance that includes the minimum requirements established in this Regulation.
- b. The local ordinance must incorporate the treatment performance standards and monitoring and reporting requirements in Section 8.
- c. The local agency must have the legal authority to control the operation of ONWS and shall establish ONWS treatment system design criteria, permitting, cross connection control, reporting, notification, and enforcement procedures for ONWS.
- d. Local agencies approving ONWS shall retain permanent records of their approval actions and, if required by the State Agency, make those records available upon written request for review by the State Agency.
- e. A local agency may implement this Regulation, or a portion thereof, using its local authority to enforce the Regulation.
- f. Nothing in this Regulation shall preclude a local agency from adopting or retaining other regulations for ONWS in a local program that are more stringent than those contained in this Regulation.
- g. A local agency must issue a permit for the operation of ONWS at multi-family, mixed-use and non-residential Buildings. A local agency may charge a fee to offset the costs of regulating the ONWS.
- h. [*Optional Element*] If required by the State Agency, local agencies allowing ONWS pursuant to this Regulation shall submit an annual report to the State Agency. The annual report may include the following information (organized in a tabular spreadsheet format):
 - i. Number, location, and description of permits issued for new and replaced ONWS within the local agencies jurisdictional area;
 - ii. Number and location of complaints and/or malfunctions pertaining to ONWS operation and maintenance, and identification of those which were investigated and how they were resolved; and,
 - iii. Summary of site inspections conducted by the local agency.

Section SR.8 Mandatory Treatment Performance Standards

- a. Project applicants must design and operate the ONWS to achieve the mandatory minimum treatment performance standards for blackwater, graywater, and roof runoff as set forth in Table 1 that represent ninety-fifth percentile log reduction targets based on three reference pathogens (enteric viruses, enteric bacteria, parasitic protozoa) and Table 2 for stormwater. Where applicable, project applicants shall validate each of the

treatment processes used to meet the requirements in Table 1 and Table 2 for their log reduction by submitting a report to the local agency for review and approval, or by using a challenge test approved by the local agency during field verification that provides evidence of the treatment. The validation report and/or challenge test shall be prepared by an engineer licensed in the state in wastewater treatment and/or public water supply, including the evaluation of treatment processes for pathogen control.

- b. If the log reduction targets are not being met based on approved ongoing surrogate parameter monitoring, the project applicant shall immediately investigate the cause and initiate corrective actions.
- c. When sources of water are blended, the log reduction target for the most contaminated source with respect to human-infectious pathogens shall be the applicable target, regardless of volume.
- d. Water from an ONWS must not create a nuisance, odor, threaten human health, or damage the quality of surface water or groundwater.

Table 1. Log reduction targets for 10⁻⁴ per person per year benchmarks for ONWS using blackwater, graywater, or roof runoff

Water Use Scenario	Enteric Viruses	Parasitic Protozoa	Enteric Bacteria
Domestic Wastewater or Blackwater			
Unrestricted Irrigation	8.0	7.0	6.0
Indoor Use	8.5	7.0	6.0
Graywater			
Unrestricted Irrigation	5.5	4.5	3.5
Indoor Use	6.0	4.5	3.5
Roof Runoff			
Unrestricted Irrigation	Not applicable	No data	3.5
Indoor Use	Not applicable	No data	3.5

Table 2. Log reduction targets for 10⁻⁴ per person per year benchmarks for ONWS using stormwater

Water Use Scenario	Enteric Viruses	Parasitic Protozoa	Enteric Bacteria
Stormwater (10⁻¹ dilution)			
Unrestricted Irrigation	5.0	4.5	4.0
Indoor Use	5.5	5.5	5.0
Stormwater (10⁻³ dilution)			
Unrestricted Irrigation	3.0	2.5	2.0
Indoor Use	3.5	3.5	3.0

Section SR.9 Monitoring, Sampling, and Reporting Requirements

- a. During initial system startup, water quality sampling is required quarterly, monthly, weekly, daily, or continuously as determined by the local agency, depending on the source water and end use. Sampling requirements may be modified if evidence indicates that the modified requirements maintain public health protection. Subject to the treatment processes utilized in the ONWS, water quality sampling requirements may be minimized or eliminated after conditional startup if the log reduction targets are being met based on approved ongoing surrogate parameter monitoring.
 - i. Water samples must be analyzed by a certified laboratory using methods approved by the US Environmental Protection Agency (EPA) or standard methods for water sampling and analysis. Laboratory reports shall be signed by the laboratory director or a designee.
- b. To meet the log reduction targets on an ongoing basis, the project applicant shall report to the local agency on the type of continuous monitoring to be utilized. The local agency will determine the credited log reduction based on the surrogate parameter utilized for continuous monitoring. ONWS shall perform ongoing continuous monitoring using the pathogenic microorganisms of concern or a microbial, chemical, or physical surrogate parameter(s) that verifies the proper operation and maintenance of each treatment process's ability to achieve its credited log reduction. Instrumentation with continuous monitoring capabilities shall be approved by the local agency and routinely calibrated.
- c. Water quality sampling and continuous monitoring results shall be reported to the local agency at the frequencies listed in Table 3 via an approved report format and be accompanied by data in an approved electronic format. For continuous monitoring, the local agency shall determine the appropriate parameters (i.e. minimum, maximum, average) to be reported. A report shall include:
 - i. System treated water flow (gallons per day, gallons per week or gallons per month);
 - ii. Water quality characteristics in accordance with the permit; and
 - iii. Attachments describing any malfunctions, breakdowns, upsets, bypasses, odors, complaints, or other system operation anomalies.
- d. The project applicant shall submit an annual report to the local agency describing compliance of the ONWS with the Regulation and the limits and conditions of the permit.

Table 3. Routine Reporting Frequency

Alternate Water Source	Routine Reporting Frequency ¹
Domestic Wastewater or Blackwater	Monthly
Graywater	Monthly during Conditional Startup Mode, Annually thereafter
Stormwater	Monthly during Conditional Startup Mode, Annually thereafter

Roof Runoff	Monthly during Conditional Startup Mode, Annually thereafter
Notes:	
1. Operational changes, system malfunctions, and/or monitoring results which are outside of the applicable water quality limits shall be reported within 24 hours.	

Section SR.10 Design Requirements

A connection to the public potable water supply shall be available in the event that the ONWS needs potable make-up water for indoor uses. The public water supply shall not be used as a backup or supplemental source of water for an ONWS unless the connection between the two systems is protected by an air gap or other appropriate backflow device.

A bypass to the building’s sewer shall be available in the event that the treatment system must be taken offline for service. The connection to the sewer must be protected by an air gap or other appropriate backflow prevention device in order to prevent wastewater from entering the ONWS.

Section SR.11 Operation Requirements

When the local agency determines the project applicant has satisfied all the requirements of this Regulation, the state or local agency may issue a permit to operate the ONWS. Permittees shall timely submit all water quality monitoring information required by the provisions of this Regulation.

Cross-connection testing is completed prior to initial operation of the system and at intervals thereafter as required by the state or local agency. All cross-connection testing must be conducted by a certified cross-connection specialist in the presence of the state or local agency to determine whether a cross-connection has occurred.

ONWS shall immediately divert the alternate water source to the municipal 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.

Section SR.12 Use Area Requirements

- a. All use areas where treated alternate water sources are accessible to the public shall be posted with signs that are visible to the public that include the following wording: “Non-potable water—do not drink.”

- b. Use of treated alternate water sources shall comply with the following:
 - i. Water from an ONWS used for irrigation or dust suppression must be applied at a rate that will not result in ponding or pooling, or cause runoff, other than incidental runoff, across the property lines or onto any paved surface.
 - ii. Water from an ONWS is prohibited from entering a municipal stormwater drainage system or other water body, unless otherwise permitted through a local regulation and in compliance with the Clean Water Act.
- c. Water from an ONWS used for unrestricted irrigation of publicly accessible areas must be applied at times when possible contact with the public is minimized.