City of Petaluma Recycled Water Program

Rules & Regulations for Recycled Water Customers

Abbreviations

Abbreviations used throughout this document are listed below for reference. Definitions for terms are listed in *Appendix A - Definitions.*

AWWA	American Water Works Association
County DHS	Sonoma District of the North Coast Section of the California Department of Health Services Drinking Water Branch
NPDES	National Pollutant Discharge Elimination System
City	City of Petaluma
RP Device	Reduced Pressure Principal Backflow Prevention Device
RWQCB	San Francisco Bay Regional Water Quality Control Board
State DHS	State of California Department of Health Services
Title 22	California Code of Regulations, Title 22
UPC	Uniform Plumbing Code

Introduction

Purpose
This document contains the City of Petaluma Recycled Water Program (herein referred to as "the City") rules, regulations, and guidance for design and operation of on-site recycled water facilities. The document covers requirements for existing sites and new developments and should give the customer information necessary to meet all applicable regulations. Every effort has been made to ensure that facilities designed, constructed, and operated on the basis of this document will comply with all existing codes, laws, statutes, and regulations concerning the use of recycled water.

Authority and Sources
This document draws on a number of references concerning the use of recycled water. Of primary importance are the Guidelines for Distribution of Nonpotable Water developed by the California-Nevada Section of the American Water Works Association (AWWA) and the regulations regarding the use of recycled water ("Title 22") circulated by the State of California Department of Health Services (State DHS). It also draws on regulations contained in the San Francisco Bay Regional Water Quality Control Board permit (No. 96-011). This document was developed specifically for customers of the Petaluma Recycled Water Program, and it takes precedence over general guidelines (including AWWA guidance documents) where differences are noted. Since codes, laws, statutes, and regulations can change without prior approval or knowledge of the City, the City does not assume any liability for errors in this document. Within the City of Petaluma service area, various customers or individual facilities may have site-specific requirements, which are usually set forth in the individual Recycled Water Use Permit. It is the responsibility of the customer to obtain written approval from the City before initiating any changes to their on-site recycled water system. Interested parties may contact the City for copies of documents referenced in the Rules and Regulations.

Acknowledgement
In preparing this document, the City acknowledges the assistance of a number of agencies including State DHS and the San Francisco Bay Regional Water Quality Control Board.

Severability
If any section, subsection, clause, or phrase of these Rules and Regulations is determined to be invalid the remaining portions of these Rules and Regulations shall remain in effect.

City of Petaluma Contact Information
Any questions regarding the Rules and Regulations should be addressed to:
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Section One - Planning for Recycled Water Use

A general guideline to help new and existing facilities plan for the use of recycled water.

Determination to Use Recycled Water

The City of Petaluma operates a disinfected tertiary system serving large agricultural, vineyard, and golf course customers, as well as providing recycled water for landscape and turf irrigation at parks, schools, open spaces, commercial/industrial facilities, and the airport. All users served by the City of Petaluma's Recycled Water Program will meet all criteria for the use of the recycled water provided. All irrigation systems must be metered separately from the potable water supply system and must have no on-site cross-connections to the potable water supply. The City of Petaluma may add and remove recycled water users to accommodate increased recycled water production due to increased wastewater production within the city; to provide for offset of potable water with recycled water; and to implement a more cost effective recycled water program.

Protection of Public Health

The City reserves the right to take any action necessary with respect to the operation of the customer's recycled water system to safeguard public health. If real or potential hazards are evidenced at any time during construction or operation of the recycled water system, the City reserves the right and has the authority to terminate recycled water service immediately, without notice. These hazards include, but are not limited to, cross-connections with the potable system, improper tagging, signing, or marking, or unapproved/prohibited uses. The City may elect to temporarily replace the recycled water supply with potable water only after the customer's recycled water system has been disinfected and approval has been granted by the City of Petaluma and State DHS. All modifications required to replace the recycled water supply with potable water will be at the customer's expense.

Approved Uses of Recycled Water

Sites may use recycled water for a variety of uses approved by State DHS. Uses of disinfected tertiary recycled water include but are not limited to: landscape and agricultural irrigation, construction water, water for industrial purposes, impoundments (fountains), and indoor toilet and urinal flushing.

Each use of recycled water must have a Permit from the City prior to receiving recycled water. The State of California regulates the use of recycled water, as directed under Title 22. The City, at their discretion, can require or specify what sites and/or uses of recycled water are to be utilized in their service area, so long as it complies with State requirements. Sites must use recycled water only for those uses approved by the City and State DHS.

Irrigation systems must be designed and operated to minimize overspray, runoff, and ponding. This requirement does not apply to landscape impoundments such as fountains, ponds, or lakes.

Recycled Water Use Permit
Every site must obtain a Permit to Use Recycled Water from the City prior to receiving recycled water. Permits will only be issued after the site has met all of the Permit conditions. Typically, these requirements include construction, inspection, cross-connection certification, and site-supervisor training. Following Permit issuance, a site may receive recycled water in accordance with the requirements of the Permit and the City Rules and Regulations. The City may revoke the Permit at any time.

If the on-site recycled water system is found to be in violation of the Rules and Regulations, the City will direct the customer to mitigate for these violations. A site inspection will be scheduled after a reasonable mitigation period to ensure compliance. Failure to comply will result in termination of recycled water service.

Local Authority
The City of Petaluma is the recognized local authority. The local authority is the retailer of recycled water to the site and is responsible for the implementation of the Rules and Regulations.

Section Two - Design, Installation, and Inspection

Purpose
The purpose of this section is to provide designers of on-site irrigation systems rules and guidelines for the design, installation, and inspection of recycled water irrigation systems.

What you can expect to find in this section

- Requirements for design, installation, and inspection of new recycled water irrigation systems.
- Requirements for design, installation and inspection of existing irrigation systems that are converting from a potable to a recycled water supply

I. Design Requirements at the Service Connection

Exceptions for Existing Irrigation Systems
With the exception of pipe identification and pipe separation, facilities where the existing buried piping system is converted from potable to recycled water must meet the same requirements as new facilities. However, any new buried piping added to existing piping at a retrofitted site must meet the identification and separation requirements for new systems. In addition, any existing piping uncovered for any reason during construction must be marked according to pipe identification requirements to the extent feasible.

Pressure
The City of Petaluma Recycled Water distribution system will provide disinfected tertiary water to customers at pressures that range from 50-150 psi. Designers should contact the City to determine the pressure available at their specific point of connection.

Point of Connection Location
Designers must contact the City of Petaluma or consult development plans to verify the water meter location, the size of the lateral, and meter available to serve their facility.

Separation Requirements

> **Tertiary Recycled Water**
> All tertiary recycled water service laterals and meters must be at least four feet (horizontal separation) from the nearest potable water facility, including pipelines, meters, and hydrants.

Designers should check to see that laterals and meters that serve their site meet these requirements. In the event that a horizontal separation is less than the requirement, designers should bring this to the attention of the developer or the City before proceeding with on-site system design.

Backflow Prevention: Protection of the Public Recycled System
Since recycled water is not used for drinking purposes, *backflow protection is not normally necessary on recycled water systems.* However, the City must ensure that customers do not

compromise the quality of the recycled water in the distribution system. Therefore, the City will require backflow protection on the customer's recycled water system if it is determined that there is a backflow hazard on-site which threatens the integrity of the distribution system. Examples of sites that may be required to install backflow protection devices are:

- irrigation sites where direct chemical fertilizer injections systems are installed on the irrigation system,
- irrigation sites where recycled water impoundment may cause a backflow hazard.

In such cases, backflow prevention devices might be required at the recycled water service connection or at specific, on-site locations as appropriate to the situation. Backflow prevention assemblies must be shown on plans and a type approved by state DHS. It will be the responsibility of the customer to provide test reports for on-site backflow prevention devices, whereas backflow devices at the service connection fall under the responsibility of the City. Devices must be properly maintained, inspected quarterly, and tested at least annually. Backflow prevention devices, when required on recycled water systems, must be conspicuously labeled. Test equipment must be dedicated for use with recycled water. Backflow testing equipment used for recycled water must not be reused on potable water systems.

II. Design Requirements for On-site Facilities

No Cross-Connections
No cross-connections are allowed between the recycled water system and any other water system.

Pipe Separation
The minimum separation distances set forth in this section shall be measured from the nearest outside edge of each pipe barrel.

> **Tertiary Recycled Water**
> A minimum vertical separation of one foot and a minimum horizontal separation of four feet between parallel, buried tertiary recycled and potable water pipelines should be maintained.

Vertical Separation at Crossings
Where a buried disinfected tertiary recycled water pipeline crosses a buried potable water pipeline, it must be located a minimum of one foot below the potable water pipeline. Recycled water pipelines are allowed over potable water pipelines with a minimum of one foot vertical separation if a full standard pipe length is centered over the crossing, or the recycled water pipeline is installed in a pipe sleeve which extends a minimum of 10 feet on either side of the potable water piping.

Pipe Class

Type of Recycled Water Piping	Size	Class
Constant pressure PVC	1.5” diameter and smaller 2.0” diameter and larger	Schedule 40 or greater Class 315 of greater

Intermittent pressure PVC lateral piping		Class 200 or greater
Copper piping		Type "K" or greater

Depth of cover and thrust blocking
All on-site recycled water piping must be buried to a minimum depth from finished grade to top of pipe (minimum cover) according to the following schedule:

Type of Recycled Water Piping	Minimum Cover
Intermittent Pressure (all sizes)	12 inches
Constant Pressure, 2.5 inch diameter and smaller	18 inches
Constant Pressure, 3-inch diameter and larger	24 inches

All recycled water piping other than PVC piping with solvent welded joints must be protected against movement with thrust blocks or restrained joints or other approved methods conforming to UPC Section 609.1.4.

Prevent Overspray, Runoff, and Ponding
Irrigation systems must be designed and operated to minimize overspray, runoff, and ponding. Designers must specify appropriate irrigation devices to prevent overspray in narrow areas. In the event that, during the coverage test, noticeable overspray, runoff, and/or ponding is observed, facilities will be adjusted or removed and relocated as needed. This requirement does not apply to landscape impoundments such as fountains, ponds, or lakes.

Protection of Drinking Fountains and Outdoor Eating Areas
Drinking fountains, outdoor eating areas, and other similar facilities (e.g. snack bars) located within the approved use area must be protected from overspray or contact with recycled water. Protection may be accomplished by relocating the irrigation system or relocating or modifying the protected facilities.

Protection of Aquifers

Tertiary Recycled Water
Irrigation systems must be designed so that irrigation with disinfected tertiary recycled water does not take place within 50 feet of any domestic water supply well. Disinfected tertiary recycled water impoundments must be located at least 100 feet (horizontal separation) from any domestic water supply well.

Protection of Public Potable Water Systems – Backflow Prevention
Although not normally a part of on-site recycled water irrigation systems, it must be noted that backflow prevention devices are a required and important part of potable water service connections to sites where recycled water is used. At premises where both recycled water and potable water are present in separate piping systems with no interconnection, a reduced pressure (RP) principal backflow prevention device must be located as close as practical to the downstream side of every potable water meter.

All RP devices must be inspected quarterly and tested at least annually. The customer is responsible for coordinating the testing. An AWWA-certified backflow prevention device tester must do the device testing. Test reports must be provided to the City and the customer, and the City must maintain records for a minimum of three (3) years.

Hose Bibbs
Hose bibbs are not allowed on recycled water systems.

III. Design Approval

Before any new recycled water system is constructed or any existing recycled water system is modified, on-site recycled water system plans prepared by the customer must be approved by the City and the State DHS. Approval will be contingent upon evidence that all applicable design requirements for a recycled water system are satisfied, and that the system as designed can be operated in accordance with the City Rules and Regulations. While the City and the State DHS review plans, the customer is responsible for meeting all requirements, even those requirements not shown on the approved plans.

IV. Information Required On Plans

The following is a brief list of the information required on the plans for every on-site recycled water system. Note that compliance with every item on this list does not guarantee that the plans will be approved since regulations and policies may change and some sites may require additional provisions.

- Indicate all **sources of water** on the plans.
- Show the location and size of all **water meters** on the piping plans.
- Show location and type of all **backflow prevention devices** for potable water systems (generally, backflow prevention devices are not used on recycled water systems).
- Show location and type of all **strainers, pressure regulating valves, and master valves**.
- Show location of all **water pipelines** (including potable and well lines) crossing the site. If space does not permit this information to be placed on the irrigation plans, then a separate site or utility plan can be used to show this information. Exception for an existing irrigation system converting to recycled water: Although it may not be possible to show the location of all water pipelines at this type of site, all locations where future recycled water piping must be separated from the potable water piping must be clearly indicated on the plans.
- Clearly identify all adjacent **streets**, and locations of all major improvements on the site.
- Show the location of all **drinking fountains, outdoor eating areas, and other public facilities supplied with recycled or potable water** service. Public facilities include, but are not limited to, restrooms, snack bars, swimming pools, wading pools, decorative fountains, and showers. Show the pipelines feeding all of these facilities.
- Show the location of any **wells, lakes, ponds, reservoirs, or other water impoundments** located on the site or within 100 feet of the site and indicate the type of water source.
- Indicate that the **separation between potable and recycled water lines** meets minimum requirements. (See *Design Requirements* on page 6*).* Show sleeving where recycled water pipelines cross over potable water pipelines.

- When **potable water piping is not present** on the site, state in a note that the cross-connection test required by the City is waived for sites where potable water piping is not present.
- Show all details necessary to properly construct the system, including the details conforming to the City's requirements. The purpose of the details is to show the materials and methods necessary to clearly identify all water systems on the site.
- Include an **irrigation equipment legend** specifying all materials of construction for the system, including:
  - A pipe schedule listing pipe sizes, materials of construction, and type of water conveyed by the piping.
  - A listing of valve types, including quick coupling valves.
  - All pertinent information for each type of sprinkler head and/or emitter.
  - Indication of purple-colored pipe with recycled water stenciling and quick coupling valves with purple covers where recycled water is used.
- Supply the following **information box** for each recycled water system with its own meter; place this information on the same sheet as the meter/point of connection to which it pertains. Fill out the ten items as applicable, but do not delete any of them.

GENERAL SITE INFORMATION for RECYCLED WATER USE

1. LANDSCAPED RECYCLED WATER IRRIGATION USE AREA: *(square footage*).
2. PUBLIC ACCESS TO SITE GROUNDS IS *(indicate: UNRESTRICTED or RESTRICTED)*.
3. OWNER: *(legal property owner's name).*
4. PROPERTY MANAGER CONTACT: *(name, title, and telephone number).*
5. TENANT (S): *[name(s) & phone number(s); if not applicable, state NOT APPLICABLE]*.
6. ON-SITE WELL LOCATIONS: *(for example, ONE; if none, state NONE)*.
7. WELLS ON ADJACENT SITES LOCATED WITHIN 50 FT. OF RECYCLED WATER APPROVED USE AREA OR WITHIN 100 FT. OF ANY RECYCLED WATER IMPOUNDMENT: (*for example, ONE; if none, state, NONE).*
8. OUTDOOR DRINKING FOUNTAINS IN/NEAR THE RECYCLED WATER APPROVED USE AREA: (*for example, ONE; if none, state, NONE).*
9. OUTDOOR EATING AREA(S) IN/NEAR THE RECYCLED WATER APPROVED USE AREA: (*for example, ONE; if none, state, NONE).*
10. WATER FEATURES ON SITE: *(examples below; if none, state NONE).*

Number:	Type:	Water Source:
One	*fountain*	*recycled*
One	*pond*	*potable*

- All sites using recycled water must post **clearly visible signs** conforming to the City Recycled Water Program details. Show proposed sign locations on irrigation plans.
  - For many sites, typical locations for signs are at the property line near crosswalks, at driveway entrances, and at outdoor eating areas.

- For streetscapes (parkways, frontage, or backup landscaping), place signs at street corners and entranceways as appropriate to notify passersby. In any case, signs must be placed no further than 1,000 feet apart.
- For medians, a sign should be placed at the beginning and end of every median, and another approximately equidistant from the ends of the median for longer median areas.
- For decorative fountains, ponds, and other water features, *see the Decorative Fountains, Ponds, and Other Water Features* section on page 13 for more information.

V. Installation and Construction Inspection

A. Installation Criteria

Pipe Identification
All new piping, whether for a new or retrofitted system, must be installed according to the approved plans and marked per these requirements to clearly distinguish between recycled water and potable water systems.

1. Identification of Buried Recycled Water Lines

The use of purple colored pipe with continuous wording "RECYCLED WATER – DO NOT DRINK" printed on opposite sides of the pipe is the preferred method for identification of new buried recycled water piping (constant-pressure mainlines/intermittent-pressure laterals). Pipes must be laid with wording facing upwards.

An acceptable alternative: all new buried recycled water lines (constant-pressure mainlines/intermittent-pressure laterals) must be identified by continuous lettering on three inch (3") minimum width, purple marking tape with one inch black or white contrasting lettering bearing the continuous wording "RECYCLED WATER – DO NOT DRINK." This tape must run continuously on top of all piping (mainlines and laterals) and must be attached to piping with plastic tape banded around the marking tape and the pipe every five feet on center. Marking tape must extend to all valve boxes and/or vaults and exposed piping.

2. Identification of Existing Buried Recycled Water Lines

Existing buried piping which will be converted to recycled water use need not be marked unless the piping becomes exposed, such as during installation of new pipeline or maintenance of existing pipe. The exposed section must be marked as indicated above for new piping.

3. Identification of Above Grade Recycled Water Lines

All above grade recycled water pipelines, whether new or existing, must be labeled with the words " RECYCLED WATER - DO NOT DRINK" and color-coded purple to differentiate recycled water pipelines from potable water pipelines. If purple identification tape is used to label the pipe and/or color code the pipe, the tape must be adhesive, permanent, and resistant to environmental conditions. Purple bands may also be painted around the circumference of the pipe at ten-foot intervals for color-coding. Purple PVC pipe is not an acceptable alternative for color-coding because the purple color will fade when exposed to sunlight.

4. Identification of Recycled Water Lines Inside Structures

Exposed (not buried) constant pressure recycled water irrigation pipelines, such as copper or galvanized pipelines, that might be used in a structure such as a parking garage to route recycled water, must be identified per UPC Appendix J, with the exception that the labeling on the piping must read "CAUTION: RECYCLED WATER – DO NOT DRINK." Intermittent-pressure lines inside a structure must be identified by affixing decals to this piping at ten-foot intervals and wherever the piping changes directions. These decals must be purple in color and must be imprinted in nominal one-inch-high, black, uppercase letters, with the words "RECYCLED WATER – DO NOT DRINK," and must be adhesive, permanent, and resistant to environmental conditions.

Valve Boxes

All remote control valves, isolation valves, pressure reducing valves, and strainers for on-site recycled water systems must be installed below grade in a valve box. Green, black, or purple valve boxes and lids are acceptable.

Valve boxes must have an advisory label or "nameplate" permanently molded into or affixed onto the lid with rivets, bolts, etc. Labels must be constructed of a purple weatherproof material with the wording "RECYCLED WATER - DO NOT DRINK - NO TOMAR" permanently stamped or molded into the label.

Quick Coupling Valves

New quick coupling valves must be made specifically for recycled water use. New quick coupling valves must be 3/4-inch or one-inch nominal size and of brass construction with a maximum working pressure of 150 psi. The covers on all new quick coupling valves must be permanently attached and made of purple rubber or vinyl with the words "RECYCLED WATER" imprinted on the locking cover. To prevent unauthorized use, the valve must only be operated by a special coupler key for opening and closing the valve. New quick coupling valves must be installed approximately 12 inches from walks, curbs, header boards or paved areas. Quick coupling valves used in the recycled water system must be installed in a valve box, where applicable, and a recycled water identification tag must be permanently attached to the quick coupling valve or the inside of the box so that it is clearly visible when the box lid is removed.

Any wands, sprinkler heads, fittings, or other attachments used in conjunction with the quick coupling valves must be labeled with the words, "RECYCLED WATER - DO NOT DRINK." Attachments used in a recycled water system must not be used in a potable water system.

The installation of quick coupling valves on a potable water system in the vicinity of a recycled water irrigation system must be of a different type to prevent accidental cross-connection or contamination by accidentally interconnecting or interchanging attachments. Keys and attachments must not be interchangeable. Retrofitted potable water system quick coupling valves must be modified to meet standards for new recycled water quick coupling valves.

Other Valves and Devices

1. **Isolation Valves**

New and existing isolation valves must be installed in a marked valve box with a recycled water identification tag on the valve operator or, if the valve operator is too deep to reach, at the top of the valve box extension.

2. **Remote Control Valves**

New and existing remote control valves must be installed in a marked valve box with a recycled water identification tag on the valve.

3. **Pressure Regulating Valves and Strainers**

New and existing pressure regulating valves and strainers must be installed in a marked valve box with a recycled water identification tag on the valve/strainer.

4. **Water Meters, Pumps, Pump Control Valves, Air/Vacuum Relief Valves**

All of these recycled water devices must be tagged with a recycled water identification tag.

5. **Recycled Water Backflow Prevention Devices**

If applicable, these devices must be tagged with a recycled water identification tag.

6. **Potable Water System Devices**

At recycled water use sites where potable water is used, all potable water meters and above grade water devices, such as backflow prevention devices and hose bibbs, must be tagged or labeled with potable water identification tags, or labels.

Identification Tags and Stickers

Identification tags and stickers must be weatherproof and durable, such as plastic or plastic coated. Recycled water identification tags and stickers must have a purple background with permanent black lettering stating, "RECYCLED WATER - DO NOT DRINK" and "AVISO, AGUA IMPURA - NO TOMAR". Potable water identification tags and labels must have a blue background with "POTABLE WATER" and "AGUA PARA TOMAR" in permanent black lettering.

Irrigation Controllers

New recycled water system controllers must be automatic with multiple start/stop times for any 24 hour period and installed according to the approved plans and local codes. All recycled water system controllers must be identified by affixing a sticker or “nameplate” to the outside of the controller cabinet, the inside of the controller cabinet, or the outside or inside of the controller cabinet enclosure. Stickers or nameplates must be weatherproof and must contain wording in English and Spanish indicating that the controller is for a recycled water system.

Irrigation and Water Feature Advisory Signs

All sites using recycled water must post clearly visible signs conforming to the City of Petaluma Recycled Water Program details and installed per the locations indicated on the approved plans.

1. Irrigation Systems at Fenced Facilities

Advisory signs indicating the use of recycled water must be installed at all entrances to the customer's facility. The City may require additional signing on a case-by-case basis.

2. Irrigation Systems at Facilities Not Surrounded by Fences

Advisory signs must be placed where they can be easily seen. To the extent necessary to advise passerby, signs must be posted at the property line near crosswalks, at driveway entrances, at outdoor eating areas, or as otherwise determined by the City. For streetscapes (parkways, frontage or backup landscaping), place signs at street corners as appropriate to notify passersby. Signs must be placed no further than 1,000 feet apart. For medians, a sign is usually placed at the beginning and end of every median, and another approximately equidistant from the ends of the median for longer median areas.

The signs must include the words "IRRIGATED WITH RECYCLED WATER - DO NOT DRINK – NO BEBER." The City may also require the signs to include translations into other foreign languages if appropriate. The lettering on the signs must be a minimum of 1/2-inch in height and must be black or white on a purple colored background and “City of Petaluma Recycled Water Program” must be written on the sign. Where required for aesthetic or corporate identity purposes, alternate color-coding schemes may be adopted subject to the approval of the City. Consult the City for final approval of signs using alternate color-coding.

3. Decorative Fountains, Ponds, and Other Water Features

Minimum requirements for water feature signs:

- Minimum wording: “This ____ *[insert type of water feature here, such as Fountain, Pond, etc.]* Uses Recycled Water – Do Not Drink – No Beber.”
- Minimum size: no less than 4 inches high by 8 inches wide.
- Must be permanently, legibly printed and posted in conspicuous places.
- Colors for lettering and background follow the same guidelines as for irrigation signs.

The City must be consulted for final approval of all signs, as well as the number of signs required per water feature and the placement of those signs.

Required Temporary Connection to Potable Water Service

In order to prevent cross-connections, an irrigation system is usually not allowed to receive recycled water until its site has passed a required cross-connection test. This means that this irrigation system must be supplied with water from a jumper (temporary connection) to an on-site potable water system up to and during the cross-connection test. After passing this test, the jumper must be removed, and the system connected to the recycled water meter. Jumpers providing water from the public recycled water system into the on-site recycled water system are prohibited at all times. Irrigation systems not needing a temporary potable water source are usually systems where there is no potable water at the site, such as some streetscapes and medians.

B. Inspection

Construction Inspection & Field Verification
The RWQCB requires that the City conduct on-site inspections during the construction phase to ensure that materials, installation, and procedures are in accordance with the approved plans, specifications, and all applicable regulations. The Field Verification will ensure that all requirements have been met and that the proper tags, labels, and signs are in place. Accordingly, the customer must notify the City of the schedule for all phases of planning, construction, and start up so that inspections can be scheduled. The constant-pressure mainline piping portion of all systems must conform to the requirements of the UPC Sections 103.5.1 through 103.5.4.2.

Cross-Connection Test
The customer must conduct a cross-connection test (and the customer's site must pass this test) before connecting the customer's recycled water system to the City's recycled water system at any use-site where both recycled and potable water are present in separate piping systems. This test is to ensure the absolute separation of the recycled and potable water systems. The customer must notify the City at least 48 hours prior to the test so that a City representative may be present. The cross-connection test must be done under the supervision of a City representative and performed by an AWWA-certified cross-connection control specialist supplied by the City. The Site Supervisor must be present at the test. The test must be done with potable water charging the irrigation. A written report documenting the test results must be submitted by the AWWA-certified cross-connection control specialist to the Site Supervisor and the City following test completion. Cross-connection test procedures are contained in *Appendix B.*

Approval to Receive Recycled Water
The City must grant final approval before recycled water can be supplied to the site. Final approval will be granted when construction has been completed in accordance with approved plans and specifications, all cross-connection tests have been performed, and all requirements have been met satisfactorily. After the Recycled Water Use Permit is finalized by the City and all applicable fees have been paid, the City of Petaluma will authorize the installation of the recycled water meter. The State DHS will be forwarded a copy of all test and inspection reports as well as notification that recycled water service has started. During the lifetime of the recycled water system, the City will periodically inspect the recycled water system to ensure compliance with all applicable Rules and Regulations.

Coverage Test
The customer is responsible for minimizing overspray, runoff, and ponding from their recycled water irrigation systems – new or converted to recycled water. To ensure that any overspray, runoff, or ponding is in accordance with the Rules and Regulations, the City will conduct an inspection of the on-site system. After the on-site system begins receiving recycled water, the customer or customer's representative must contact the City to schedule a coverage test walk through of the system. The customer or customer's representative must attend and have persons in attendance capable of making system adjustments. If modifications to the system (other than minor adjustments) are required, the customer will be notified in writing of the changes required. Any required modifications to the system must be made in a timely manner. All modifications to

the system are the responsibility of the customer, and the customer must pay all costs associated with such modifications.

Record Drawings

The customer – or customer's contractor – must prepare record drawings to show the recycled water irrigation system as constructed. These drawings must include all changes in the work constituting departures from the original contract drawings including those involving both constant-pressure and intermittent-pressure lines and appurtenances. All conceptual or major design changes must be approved by the City before implementing the changes in the construction contract. The recycled water irrigation system record drawings must be submitted to the City within ninety (90) days of the site receiving recycled water.

Section Three - Operation & Maintenance

General requirements for the operation and maintenance of a recycled water system.

I. General Customer Responsibilities

By accepting recycled water service, the customer agrees to comply with and enforce the City Rules and Regulations for recycled water use.

Permit Issuance
Once the customer has met all of the requirements established in *Section 2 – Design, Installation and Inspection,* the City will issue the customer a Recycled Water Permit and begin recycled water service. The customer must designate a representative who is responsible for attending the Site Supervisor Certification Training. The Site-Supervisor must attend training within 120 days of receiving the recycled water service.

Site Supervisor Designation
The customer must designate a representative to be the Site Supervisor of the recycled water use site. The Site Supervisor represents the owner, tenant, or property manager as a liaison to the City. The Site Supervisor must have the authority to carry out any requirements of the City. It is recommended that the Site Supervisor be an employee who is permanently stationed at the use site. At a minimum, the Site Supervisor must make frequent visits to the use site.

Site Supervisor Training
The designated Site Supervisor must attend a Site Supervisor Certification Training within the first 120 days of receiving recycled water service. Failure to attend the Site Supervisor Certification Training may result in the termination of recycled water service.

Changing the Site Supervisor
The customer must notify the City immediately of any change in personnel for the Site Supervisor position. Upon a change in personnel, the new Site Supervisor must attend a Site Supervisor Certification Training within 120 days of the position change. Failure to attend the Site Supervisor Certification Training may result in the termination of recycled water service.

Site Supervisor Responsibilities
The Site Supervisor:

- Is responsible for the recycled water system at the site.
- Is responsible for the operation, maintenance, and prevention of potential violations on the recycled water system.
- Must ensure that there are no cross-connections made between the potable and recycled water systems.
- Must be present at all cross-connection tests.
- Must inform the City of all failures, violations and emergencies that occur involving the recycled or potable water systems.

- Is expected to know the provisions contained in the California Code of Regulations Title 17 and Title 22, relating to the safe use of recycled water and the maintenance of accurate records.
- Is expected to know the basic concepts of backflow and cross-connection prevention, system testing, and related emergency procedures.
- Is responsible for training personnel at the use site on the proper uses of recycled water.
- Must conduct an annual self-inspection of the use site and provide a written report to the City.

Annual Self-Monitoring Report
The RWQCB requires that recycled water customers conduct an inspection at least once per year while the recycled water system is in use. The results of this inspection must be documented and submitted in a written report. The City will mail the report form to the Site Supervisor once a year. The Site Supervisor must submit the results of the observations, along with a description of any corrective actions taken. Upon completion, the Site Supervisor must keep a copy of the report for their records and must return the original. The questions on the annual inspection report are as follows:

1. Is recycled water escaping the use area through surface runoff or airborne spray?
2. Are any odors associated with use of the recycled water?
3. Is there prolonged ponding of recycled water due to over-irrigation or evidence of mosquito breeding as a result of ponding?
4. Are all warning signs, labels, and markings identifying recycled water in place legible, and visible?
5. Are there leaks or breaks in the irrigation system piping or evidence of plugged, broken, or otherwise faulty irrigation system components?
6. Is recycled water being sprayed directly on people, dwellings, food-handling facilities, or drinking fountains?

Unauthorized Discharge
An unauthorized discharge is any amount of recycled water that leaves the designated use site. Discharge of any type of water is regulated by the City per the RWQCB National Pollutant Discharge Elimination System Permit. The Site Supervisor must report to the City any unauthorized discharge of recycled water, at which time the City will specify if a written report is required. In the event of an unauthorized discharge, the Site Supervisor should make every effort to contain the recycled water and prevent it from entering the storm drain. Contact the City for further directions and disposal instructions.

Maintenance
The Site Supervisor is required to perform preventive maintenance to ensure that the recycled water system always remains in compliance with the Rules and Regulations. As part of a preventive maintenance program, the Site Supervisor should:

- Perform regular inspections of the entire recycled water system including sprinkler heads, drip irrigation system emitters, spray patterns, piping and valves, pumps, storage facilities, controllers, etc. Immediately repair all broken sprinkler heads, faulty spray patterns, leaking

pipes or valves, or any other noted condition that violates the recycled water use requirements.

- Check all recycled water identification signs, tags, stickers, and above grade pipe markings for their proper placement and legibility. Replace damaged, unreadable, or missing signs, tags, stickers, and pipe markings.
- Check spray patterns to eliminate ponding, runoff, and wind-blown spray conditions. If evidence of ponding or runoff is noted, affected areas should be indicated on a sketch and sprinkler heads should be adjusted to prevent further ponding or runoff. County Health regulations require that evidence of mosquitoes breeding within ponding should be noted and immediately eliminated.
- Establish and maintain an accurate record keeping system of all inspections, modifications, and repair work.

Personnel Training

The Site Supervisor is responsible for training all personnel involved with recycled water so they are familiar with the Rules and Regulations. At a minimum, the training program should convey the following information:

- The City's recycled water, although highly treated, is non-potable and must never be used for human consumption.
- Regulations prohibit ponding, windblown spray, and runoff of recycled water.
- Working with nonpotable recycled water is safe if common sense is used and appropriate regulations are followed.
- State law prohibits a connection between the recycled water and the potable water systems.

Training programs should also instruct personnel in proper procedures for reporting unauthorized discharges, identifying, and correcting cross-connections, and modifying the system in the event or an earthquake or other disaster.

Permit Updates

If the property is transferred to a new owner or tenant, or a new site supervisor or landscape company becomes responsible for system maintenance, the customer must notify the City within 30 days in order to receive a new Permit.

II. System Operations

A. System Responsibilities

The City

The City provides high quality recycled water at the appropriate pressure and quantity to City customers and is responsible for the operation and maintenance of the entire recycled water distribution system up to the customers storage facility, if any, and including the recycled water meter.

The Customer
The customer is responsible for maintaining and operating the on-site recycled water system downstream of the recycled water meter. This includes the following:

- Obtain all Permits required for the operation and maintenance of the on-site recycled water system.
- Apply recycled water in accordance with the Rules and Regulations.
- Maintain the on-site recycled water system, including signs, markings, and tags in accordance with all Rules and Regulations.
- Ensure all materials used during the repair and maintenance of the system are approved or recommended for recycled water use.
- Obtain prior authorization from the City before making any modifications to the approved recycled water system.
- Report all violations and emergencies to the appropriate local authority.
- Submit Annual Self-Monitoring Report to the City.

Irrigation System Modifications
The customer must receive authorization from the City before making any modifications to the approved recycled water irrigation system. This includes converting any piping used for recycled water back to potable water, such as switching from a recycled water system to a backup potable water system. The City will notify the customer if any additional approval is required from other regulatory agencies and if disinfecting procedures are required.

Emergency Procedures
In case of earthquake, flood, fire, major freeze, nearby construction, or other incident, which could cause damage to the recycled or potable water systems, the Site Supervisor must inspect the domestic and recycled water systems for damage as soon as it is safe to do so. If either system appears damaged, both the domestic and recycled water systems should be shut off at their points of connection. The Site Supervisor must immediately contact the City for further instruction.

To prevent contamination, damage, or a public health hazard, the customer may make emergency modifications or repairs without the prior approval of the City. As soon as possible after the modification (but within three days), the customer must notify the City of the emergency modifications and file a written report.

B. Operating Problems

Notification
In the event of a break in the system, low pressure, low flow or poor water quality, the customer should notify Matthew Pierce at the City of Petaluma at phone number 707-776-3777.

C. Dual Plumbed Sites
Dual plumbed sites are sites where the recycled water is used within a building in conjunction with a potable water system. According to DHS regulations, at dual-plumbed use sites the customer is responsible for conducting a periodic cross-connection test every four years, unless

visual inspections reveal a requirement for more frequent testing. This test must be done by an AWWA-certified cross-connection specialist. The customer must notify the City at least 48 hours in advance of the test in order for their representative to be present if appropriate. The Site Supervisor must be present at the test.

D. Industrial Uses

Dual Plumbed Regulations
If recycled water is used inside a building, all dual plumbed regulations apply.

Visual Inspection and Cross-Connection Review
A visual inspection and thorough cross-connection review of the recycled water system should be conducted annually by the Site Supervisor.

Cross-Connection Tests
Once every four years, the customer must have a cross-connection test performed by an AWWA certified cross-connection control specialist to verify that there is not a cross-connection between the recycled water and potable water systems. The certified cross-connection control specialist must submit a written report documenting the test results to the Site Supervisor and the City.

For specific individual uses, other regulations may apply (Food & Drug Administration, OSHA). Contact the City for further information regarding industrial uses.

E. Impoundments

Recycled water can be used for a variety of impoundments, including golf-course ponds, decorative fountains, stream-flow augmentation, and other water-based recreational activities. The biggest consideration when managing water features, whether potable or recycled, is the potential for algae growth. The customer should develop a maintenance program, including adequate aeration, circulation, and chlorine application, to help prevent the growth of algae. Contact the City for further information regarding impoundment maintenance.

III. Cross-Connections

A cross-connection is any physical connection between any part of a water system used or intended to supply water for drinking purposes and any source or system containing water or substance that is not or cannot be approved for human consumption. This includes direct piping between the two systems, regardless of the presence of valves, backflow prevention devices, or other appurtenances. Cross-connection test procedures and certification are contained in *Appendixes B.*

Notification of a Cross Connection
The Site Supervisor must immediately notify the City of any failure or cross-connections between the recycled water and potable water system, whether or not he/she believes a violation has occurred. The Site Supervisor must also notify the City of any violation that might occur because of any action the customer personnel might take during the operation of the recycled water or potable water systems. If there are any doubts whether a violation has occurred, the Site

Supervisor must report each occurrence to the City so a decision can be made as to the need for further action.

Scheduling Future Cross-Connection Tests
Periodic cross-connection tests of dual plumbed systems must be performed by an AWWA certified cross connection specialist, and a representative from the City and the Site Supervisor must be in attendance during the test. These tests must be performed according to the procedure listed in *Appendix B – Cross Connection Control Test Procedure for On-site Recycled Water Systems.*

Emergency Cross-Connection Procedures
In the event that a cross connection is suspected or occurs, the following emergency cross connection response plan must be implemented immediately.

Emergency Cross-Connection Response Plan:
1. The customer must notify the City by telephone immediately at 707-776-3777. This notification must be followed by a written notice within 24 hours that includes an explanation of the nature of the cross-connection, date and time discovered, and the contact information of the person reporting the cross-connection.
2. The City will notify the County DHS and State DHS of the reported cross connection.
3. The customer must immediately shut down the recycled water supply to the facility.
4. The customer must keep the potable system pressurized and post "Do Not Drink" signs at all potable water fixtures and outlets.
5. The customer must provide bottled water for employees until the potable water system is deemed safe to drink.
6. The customer must follow the procedures outlined by the County DHS, State DHS, and the City to correct the cross-connection.

After final approval has been obtained from County DHS and State DHS, the City will bring the recycled water system back into service and inform the customer to remove the "Do Not Drink" signs from all potable water fixtures and outlets.

Contamination of Potable Water
If contamination of the potable water system is suspected or known, due to a cross-connection on the customer's premises, the customer must immediately notify the City. The customer is to invoke immediately the *Emergency Cross-Connection Response Plan* described above.

Appendix A - Definitions

Whenever the following terms (or pronouns used in their place) occur in this manual, the intent and meaning shall be interpreted as follows:

AIR GAP	A physical separation between the free flowing discharge end of a water supply pipeline and an open or non-pressure receiving vessel. An approved air gap must be at least twice the diameter of the water supply pipe measured vertically above the overflow rim of the vessel, and in no case less than one inch.
APPROVED USE	An application of recycled water in a manner, and for a purpose, designated in a Recycled Water Use Permit issued by the City and in compliance with all applicable Regulatory Agency requirements.
APPROVED USE AREA	A site with well-defined boundaries designated on the approved Site Drawings, to receive recycled water for an approved use and acknowledged by all applicable Regulatory Agencies.
CROSS-CONNECTION	Any physical connection between any part of a water system used or intended to supply water for drinking purposes and any source or system containing water or substance that is not or cannot be approved for human consumption. This includes direct piping between the two systems, regardless of the presence of valves, backflow prevention devices, or other appurtenances.
CUSTOMER	Any person, persons or firm including any public utility, municipality or other public body or institution issued a Recycled Water Use Permit by the City. They may be the owner, tenant, or property manager as appropriate.
INSPECTOR	Any person authorized by the Water Retailer, the Local Authority, the City, or the local health agencies to perform inspections on or off the customer's site before construction, during construction, after construction and during operation.
INTERMITTENTLY PRESSURIZED LINE	Also known as a “lateral,” it is the pipe section(s) between the control valve and the sprinkler head or drip emitters.
LANDSCAPE IMPOUNDMENT	A body of recycled water used for aesthetic enjoyment, or which otherwise serves a function not intended to include public contact.
LATERAL	See “INTERNITTENTLY PRESSURIZED LINE”

LOCAL AUTHORITY	The Local Authority is the entity having the responsibility of enforcing the rules and regulations for the end use of recycled water. The Local Authority is typically the Water Retailer and is responsible for the implementation of the Rules and Regulations.
NONPOTABLE RECYCLED WATER OR RECYCLED WATER	Water that meets California Administration Code Title 22, Division 4 of the Environmental Health Water Reclamation Criteria and is approved for purposes other than human consumption. For the purpose of these Rules and Regulations, "recycled water" refers to "Nonpotable recycled water."
NONPOTABLE WATER	Water that has not been treated for human consumption in conformance with the latest edition of the United States Public Health Service Drinking Water Standards, the California Safe Drinking Water Act, or any other applicable standards.
OFF-SITE	Designates or relates to facilities including and upstream of the recycled water meter.
ON-SITE	Designates or relates to all irrigation facilities downstream of the recycled water meter.
OVERSPRAY	The spray of recycled water outside of the approved irrigation area.
OWNER	Any holder of legal title, contract purchaser, or lessee under a lease with an unexpired term of more than one (1) year, for property for which recycled water service has been requested or established.
POINT OF CONNECTION	This is the point where the customer's system ties to the Water Retailer's system. This is usually at the water meter.
PONDING	Unauthorized retention of recycled water on the surface of the ground or other natural or manmade surface for a period following the cessation of an approved recycled water use activity.
POTABLE WATER	Water that is authorized for human consumption according to the latest edition of the California Safe-Drinking Water Act, or other applicable standards.
POTABLE WATER FACILITY	Any facility, including fire service, used to convey potable water.

PUBLIC	Any person or persons other than the site owner or employees who may come in contact with facilities and/or areas where recycled water is approved for use.
RECYCLED WATER USE PERMIT	A permit issued to the customer as required by State DHS and the RWQCB that outlines monitoring, self-inspection, reporting, and site-specific requirements.
REDUCED PRESSURE PRINCIPAL BACKFLOW PREVENTION DEVICE	A type of backflow prevention device, usually installed near a water meter, which prevents backflow by a combination of double check valves and a pressure differential relief valve, with a resilient seated shutoff valve on each end of the device.
REGULATORY AGENCIES	Those public agencies legally constituted to protect the public health and water quality, and whose rules govern the use of recycled water, such as the State DHS, the RWQCB and the County DHS.
RESTRAINED JOINT	Mechanically restrained. Solvent welded for PVC joints 4-inch diameter and smaller.
RUNOFF	Recycled water that is allowed to drain outside the approved use area.
SERVICE	The furnishing of recycled water to a customer through a metered connection to the onsite facilities.
SITE SUPERVISOR	The responsible person designated by the customer to provide liaison with the City, and the Water Retailer. This person must have the authority to carry out any requirements of the City and/or the Water Retailer, must be responsible for the operation and maintenance of the recycled water system, and must prevent potential violations.
STANDARD PIPE LENGTH	A section of pipe 18 to 20 feet in length that has no joints.
UNAUTHORIZED DISCHARGE	Any release of recycled water that violates the rules and regulations of the City or all applicable Federal, State, or local statutes, regulations, ordinances, contracts, or other requirements.
VIOLATION	Noncompliance with any condition of the Recycled Water Use Permit by any person, action, or occurrence, intentional or unintentional.

Appendix B – Cross Connection Control Test Procedure for On-Site Recycled Water Systems

Introduction

The following procedures have been established to verify the absence of cross-connections between potable water and recycled water supplies at sites which are served by both types of water. These procedures also describe what to do in case a cross-connection is discovered. The procedures cover cross-connection testing only and do not incorporate other requirements related to the use of recycled water, which are described elsewhere.

Testing Frequency

The initial cross-connection test shall consist of the Pre-Test Requirements and Visual Inspection and the Cross-Connection Control Test, as described in the Cross-Connection Test and Report Form. This initial test shall be performed and passed at all sites converting to recycled water use prior to the site receiving approval to use recycled water. Thereafter, the procedures listed under *Pre-Test Requirements and Visual Inspection (Part I)* shall be performed annually, and the *Cross-Connection Control Testing (Part II)* shall be successfully performed a minimum of once every four years. The City may require more frequent testing if conditions dictate.

Inspection Team

All inspections and testing will be conducted by an Inspection Team consisting of a certified AWWA Cross-Connection Specialist, a representative from the City of Petaluma's Recycled Water Program, the Customer's designated Site Supervisor, and other personnel as required.

PART 1 - Pre-Test Requirements and Visual Inspection

Prior to the cross-connection testing, a visual inspection of the dual system shall by conducted by the Inspection Team. If possible, the visual inspection should be conducted prior to the date scheduled for cross-connection testing. The visual inspection should include the following elements:

1. The Customer shall provide the Inspection Team with drawings of the recycled and potable water systems. Team members shall review the drawings.

2. Discuss any changes to recycled and potable water systems since the last cross-connection test and verify that all changes have been recorded on the appropriate recorded drawing(s). If possible, visually inspect changes to verify that no cross-connection has been created.

3. Verify that appropriate backflow prevention devices are installed and have been tested annually in accordance with California Title 17 Regulations. Devices are typically located on the potable water line, downstream of the meter.

4. Check meter locations on the recycled water and potable water lines to verify that no modifications have been made and no cross connections are visible

5. Discuss who has access to the recycled water system (e.g., gardeners, maintenance, and facilities workers). Establish if they are employed by the Customer or a contractor if they can read and speak English and what type of training they have had this past year on the use of recycled water.

6. Verify that required signs are in place and in good condition.

7. Verify that all potable recycled water fixtures (e.g., hose, quick connect valves) are permanently marked to indicate that they are only to be used on the recycled water system.

PART 2 - Cross-Connection Control Testing

The Cross-Connection Test and Report Form should be completed in conjunction with the testing.

The basic concept employed in checking for cross-connections between the potable water and recycled water systems is to pressurize one system at a time, and then check the other system for flow, which would indicate that a cross-connection exists.

The following procedure shall be used to determine if a cross-connection exists.

1. The potable water system shall be activated and pressured. The recycled water system shall be shut down at the service connection only, depressurized, and where feasible, drained. Verify that all other valves on the recycled system, downstream of service connection, are open.

2. The potable water system shall remain pressurized for a minimum of one hour.

3. All outdoor potable water fixtures and all indoor drinking fountains shall be tested for flow. No flow from a potable water outlet would indicate that it could be connected to the recycled water system.

4. The recycled water system shall be tested for flow. This shall be done by opening all quick connect bibbs, sprinkler heads, and any other outlets on the irrigation system. Flow from any recycled water outlet shall be an indication that a cross-connection exists.

5. Any drain points or outlets on the recycled water system shall be checked for flow during and at the end of the test period.

6. The potable water system shall then be shut down, and where feasible, drained. The recycled water system shall then be re-activated and pressurized.

7. The recycled water system shall remain pressurized for a minimum of one hour. Recycled water fixtures shall be tested for flow to verify that the recycled water system is fully pressurized.

8. All outdoor potable water fixtures and all indoor drinking fountains shall be tested and inspected for flow. A representative number of other indoor potable water fixtures shall be tested. This should include one fixture in each restroom and at least 10 percent of the fixtures on each floor. The specific number will be determined by the Inspection Team based on the site's recycled and potable water systems drawings. Flow from any potable water outlet shall be an indication that a cross-connection exists.

9. If no flow is detected in any fixture which would have indicated a cross-connection, the test is complete, and the system may be re-pressurized.

PART 3 - Procedure if Cross-Connection is Discovered

The "Procedure if Cross-Connection is Discovered Form" should be used to document the procedure if a cross-connection is discovered. The following procedure shall be activated immediately, in the presence of the Petaluma's Cross-Connection Control Specialist.

1. Recycled water piping to the facility shall be shut down at the meter, and the recycled water system shall be depressurized and drained where feasible.

2. Potable water service shall be shut down at the meter.

3. The cross-connection shall be determined and disconnected.

4. The systems shall be tested again as described above under "Cross-Connection Control Testing" and Cross-Connection Test and Report completed.

5. The potable water system shall be chlorinated with 50 ppm chlorine for 24 hours, per methods described in AWWA Standard for Disinfecting Water Mains (ANSI/ AWWA 065 1-92). A bacteriological test shall be performed. If test results are acceptable, the potable water system may be recharged. If not, repeat step 5.

6. The retrofit plans must be revised to reflect any changes required to eliminate the cross-connection and the revised plans must be submitted to Petaluma for review.