Rules and Regulations Governing the Distribution and Use of Recycled Water

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City of Clovis

Public Utilities Department

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ARTICLE 1. General Provisions

1.1. Introduction

The City of Clovis (City) owns and operates a Recycled Water distribution system (Distribution System) providing Recycled Water for approved purposes to Recycled Water customers (Users) within a defined service area. Uses of Recycled Water, upon approval, may include greenbelt irrigation, golf course irrigation, landscape irrigation, agricultural irrigation, industrial processes, construction uses and/or approved impoundment applications. Intentional groundwater recharge using recycled water requires that the City applies for and secures the necessary approvals from the California Department of Public Health (CA DPH), the Central Valley Regional Water Quality Control Board (Regional Board), and any other applicable government agency, and modifies these Rules and Regulations, its Recycled Water User Agreements (User Agreements), and any other applicable documents accordingly.

1.2. Authority and Sources

This document establishes the City's Rules and Regulations Governing the Distribution and Use of Recycled Water (Rules and Regulations). These Rules and Regulations have been developed by the City's Public Utilities Department (Public Utilities) and are enforceable by authority of City of Clovis Ordinance No. 08-21. The City has the responsibility of enforcing these Rules and Regulations for the distribution and end use of Recycled Water.

These Rules and Regulations apply to any distributor or user of Recycled Water and shall govern the design, construction, and use of both the Distribution System operated by the City and On-site Recycled Water Systems operated by Users. The applicable terms of these Rules and Regulations shall be contractually binding to Users, as stated in User Agreements. It is the intent of these Rules and Regulations to be consistent with the following criteria:

- California Code of Regulations, *Title 22, Division 4, Chapter 3* (Water Recycling Criteria) and the *City-Wide Engineering Report* (Engineering Report).
- California Code of Regulations, Title 17, Division 1, Chapter 5, Group 4, Article 1 & 2 (Title 17);
- CA DPH's Preparation of an Engineering Report for the Production, Distribution and Use of Recycled Water,
- American Water Works Association ("AWWA") California/Nevada section, Guidelines for the Distribution of Non-Potable Water and Guidelines for the Onsite Retrofit of Facilities Using Disinfected Tertiary Recycled Water
- · Applicable regulations by the Regional Board.
- City of Clovis Municipal Code 6.5.112 Backflow prevention devices required.
- Clovis Recycled Water Rate Schedule as approved by City Ordinance.
- Manual of Cross-Connection Control, by the USC Foundation for Cross-Connection Control and Hydraulic Research.

Interested parties may contact Public Utilities for copies of documents referenced in these Rules and Regulations.

1.3. Scope and Severability

These Rules and Regulations establish the requirements for Recycled Water use and the provision of Recycled Water service by the City to Recycled Water Users. If there is any conflict between the provisions of these Rules and Regulations and the provisions of any of the documents incorporated by reference, the most stringent requirement will govern.

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.

1.4. Protection of Public Health

The City reserves the right to take any action necessary, with respect to the operation of the Distribution System and On-site Recycled Water Systems, to safeguard the public health. If real or potential hazards are evidenced any time during construction or operation of an On-site 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 a Potable Water system; improper tagging, signing, or marking; or unapproved/prohibited uses. The City may elect to temporarily replace the Recycled Water supply water with Potable Water per the User's Agreement..

1.5. Approved Uses of Recycled Water and the Distribution System

1.5.1. Approved Uses

Use Areas may be eligible to use Recycled Water for uses limited to landscape irrigation, agricultural irrigation, industrial process purposes, construction uses and certain types of impoundments. The use of Recycled Water for each specific Use Area will be assessed on a case-by-case basis and must be specifically approved by the associated User Agreement. Use Areas must use Recycled Water only for those uses approved by the City and CA DPH.

1.5.2. Tampering with City Property

No person shall at any time tamper with City property except to shut off recycled water to protect public health or to prevent damage to property or the environment. Only authorized City personnel may operate City facilities.

1.5.3. Penalties for Unauthorized Use of Recycled Water

Any party that uses Recycled Water without City approval will be liable for enforcement, as determined by City of Clovis Ordinance 08-21 or amendment thereto. Use of

Recycled Water on a site that has not been approved for the use of Recycled Water requires the immediate notification of CA DPH.

1.6. User Agreements

Every Use Area must have a Recycled Water User Agreement from the City prior to receiving Recycled Water. User Agreements will only be issued after the Use Area has met all of the User Agreement conditions, as defined by these Rules and Regulations. Following User Agreement execution, a Use Area may receive Recycled Water in accordance with the requirements of City of Clovis Ordinance 08-21, User Agreement, and these Rules and Regulations. The City may revoke the User Agreement at any time due to non conformance with the Agreement or these Rules and Regulations.

If the On-site Recycled Water System is found to be in violation of a City of Clovis Ordinance, it's User Agreement, and/or these Rules and Regulations, the City will direct the User to mitigate for such violations. A Use Area inspection by City staff will be scheduled after a reasonable mitigation period to ensure compliance. Failure to comply will result in termination of Recycled Water service.

ARTICLE 2. Definitions

The following definitions assign specific meaning to capitalized terms within these Rules and Regulations for the purpose of this document.

- "Air Gap" Generally considered the most protective method of backflow prevention, an Air Gap is 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.
- "Applicant" Party requesting Recycled Water services from the City.
- "As-Built Drawings" Engineered drawings that depict completed facilities as constructed or modified.
- "Backflow" A condition that results in the flow of water into a Potable Water system from a source other than an approved water supply.
- "City" City of Clovis, California
- "City Council" The City Council for the City of Clovis, California.
- "City-Wide Engineering Report" The Title 22 Engineering Report submitted to, and approved by CA DPH to authorize the City's Recycled Water Distribution System program, dated July 17, 2007.
- "Cross-connection" Any unapproved and/or unprotected connection between a Potable Water system and a non-potable system.
- "Distribution System" Facilities under the control of the City from, and including, the Recycled Water Storage Tanks located on-site with the ST/WRF up to and including the City's RW Service Connections with each On-site Recycled Water Systems.
- "Impoundment" A lined structure or the body of water in a lined structure containing recycled water which is used for aesthetic, recreational, or irrigation purposes.
- "Inspector" Any person authorized by the City, Regional Board, CA DPH, or local health agencies to perform inspections on or off a Use Area before construction, during construction, after construction, or during operation.
- "Non-Potable Water" Water that is not acceptable for human consumption in conformance with federal, state, and local drinking water standards.
- "On-site Recycled Water System" The User-operated recycled water system extending from the RW Service Connection to the Use Area to be provided with Recycled Water service. This includes any on-site distribution plumbing, irrigation systems, industrial processes, impoundments, or other approved facilities.
- "Overspray" The spray of Recycled Water outside of a Use Area.
- "Ponding" Any event where Recycled Water collects in the form of an unauthorized pond, regardless of the size.

- "Potable Water" Water acceptable for human consumption in conformance with all federal, state, and local drinking water standards.
- "Public Utilities" The City of Clovis Public Utilities Department, the designated authority to operate the City of Clovis Recycled Water Program.
- "Record Drawings" Use Area plans and specifications as required by Form E of the City's Application for Recycled Water Services.
- "Recycled Water" Treated wastewater produced by the ST/WRF, and delivered by the City through the Distribution System that meets the definition of "Disinfected Tertiary Water Recycling Criteria and is approved for purposes other than human consumption.
- "Recycled Water Program" The City's collection of facilities, rules, regulations, and other program elements, authorized by City of Clovis Ordinance 08-21, and enabling the treatment of Clovis wastewater for the beneficial distribution and use of Recycled Water in the Clovis area.
- "Recycled Water Storage Tank" Storage reservoir for Recycled Water and beginning of Distribution System, located at the ST/WRF site.
- "Recycled Water User Agreement" An executed contract between the City and a User, as a condition for obtaining Recycled Water service for a specific Use Area or Use Areas.
- "Regional Board" The California Regional Water Quality Control Board, Central Valley Region.
- "Regulatory Agency" One of the several federal, state, and local governmental agencies that have regulatory authority over one or more aspects of the City's Recycled Water Program, including the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers; the Regional Board, the California Department of Public Health, California Department of Fish and Game, and the Fresno County Environmental Health Department.
- "Rules and Regulations" The Rules and Regulations Governing the Distribution and Use of Recycled Water for the City of Clovis, the authoritative policies governing the City's Recycled Water program as authorized by City of Clovis Ordinance 08-21.
- "Runoff" Recycled Water that leaves an approved Use Area via surface flow.
- "RW Service Connection" The City owned and operated piping and appurtenances, including the meter assembly, extending Recycled Water service from the Distribution System to an On-Site Recycled Water System. City ownership and responsibility of the RW Service Connection ends at, and does not include, the flow control valve immediately following the meter assembly.
- "ST/WRF" The Sewage Treatment and Water Reuse Facility owned by the City of Clovis to enable the treatment of Clovis wastewater for beneficial reuse. The ST/WRF shall be operated by the ST/WRF Operator, which may be a private entity.
- "Water Recycling Criteria" The State of California's set of requirements for the implementation of recycled water programs as detailed in the *California Code of Regulations*, *Title 22*, *Division 4*, *Chapter 3*.

- "Unauthorized Discharge" Any release of Recycled Water that leaves a respective Use Area or that otherwise violates the provisions of these Rules and Regulations or any applicable federal, state, City, or local statutes, regulations, ordinances, contracts, or other requirements.
- "**UPC**" *Uniform Plumbing Code*, published by the International Association of Plumbing and Mechanical Officials.
- "Use Area" A defined area designated to be served Recycled Water through an On-site Recycled Water System. The Use Area includes all areas where Recycled Water may be used, as well as all facilities associated with the On-site Recycled Water System.
- "Use Area Operators" Any employee who participates in the operation of an On-site Recycled Water System within a Use Area.
- "Use Area Personnel" Any employee who works in or around the Use Area who may be exposed to Recycled Water during work hours.
- "Use Area Supervisor" The responsible person designated by the User to provide liaison with the City regarding recycled water matters. This person must have the authority to carry out all requirements of the Rules and Regulations, must be responsible for the operation and maintenance of the On-site Recycled Water System, and must prevent potential violations.
- "Use Area Supervisor Certification Workshop" A one-day course, approved by CA DPH and the City, designed to provide Use Area Supervisors with a basic understanding of recycled water and how to operate and maintain a safe and efficient On-site Recycled Water System.
- "User" Contracted recipient of Recycled Water services from the City of Clovis.
- "Water Code" The California Water Code, Division 7.

ARTICLE 3. General Responsibilities

3.1. City Responsibilities

The City shall be responsible for all aspects of Recycled Water production and the Distribution System by providing high-quality Recycled Water at the appropriate pressure and quantity.

Specifically, the City shall be responsible for the following aspects of the Recycled Water Program:

- Observing and permitting the physical installation, connection, and disconnection
 of the RW Service Connection, that is the piping, valves and appurtenances
 necessary to connect the Distribution System to On-site Recycled Water
 Systems. The RW Service Connection includes water meter(s) required to
 monitor the Recycled Water deliveries made to Use Area. City shall restore the
 User's easement (see Section 3.2) to its normal condition following any
 maintenance work performed within the easement.
- 2. Provide maintenance of the RW Service Connection, including the meter.
- 3. Controlling and supervising any switch of Recycled Water supply to a Use Area back to Potable Water supply.
- 4. Conducting the initial and final inspection of Use Areas as part of the User's application process for obtaining a User Agreement.
- 5. Periodic monitoring of the User's Recycled Water management practices, as determined necessary by the City.
- 6. Collecting fees from Users for the consumption of Recycled Water and related services as defined by City of Clovis Ordinance 08-21.

3.2. User Responsibilities

By accepting Recycled Water service, and in order to finalize a User Agreement, the User agrees to comply with and enforce all aspects of these Rules and Regulations under its purview. User shall perform all work and shall be responsible for all costs of construction, operation, and maintenance of all other modifications to the On-site Recycled Water System that are not specifically the responsibility of City as stated in Section 3.1. User responsibilities include, but are not limited to:

- 1. Obtaining and paying for all permits required for the installation, operation and maintenance of User's On-site Recycled Water System.
- 2. Granting City an easement for the construction of the RW Service Connection.
- 3. Paying for the installation, connection and disconnection of the RW Service Connection.
- 4. The User will obtain a permit from the City to route and tie-in piping from the Distribution System to the On-site Recycled Water System. The User will also disconnect the existing Potable Water supply from the On-site Recycled Water System under the supervision of the City. The User is responsible for installing the RW Service Connection as required to ensure that no Recycled Water enters

- a Potable Water system. The connection shall include any cross-connection prevention measures and necessary piping depths, as described in these Rules and Regulations ARTICLE 4.
- 5. Paying for, furnishing, installing, operating, and maintaining all facilities necessary to convey Recycled Water from the RW Service Connection following, the water meter assembly to the On-Site Recycled Water System in a manner that is in accordance with these Rules and Regulations and does not harm or damage any person or property.
- 6. Paying for and furnishing any modifications to the On-site Recycled Water System necessary to meet any special City requirements to meet Water Recycling Criteria that may not necessarily be explicitly stated in these Rules and Regulations. Such modifications may include, but are not limited to, sprinkler changes or modifications, quick-coupler modifications or installation, modifications to prevent unauthorized discharges, or additional requirements related to new or expanded systems.
- 7. Paying for and executing all necessary modifications to the Use Area's Potable Water system. This includes ensuring any special protection of Potable Water systems or other facilities from Recycled Water contact as required by Water Recycling Criteria, aside from the City's responsibility to connect/disconnect the RW Service Connection.
- 8. Providing all initial and ongoing on-site management and operation of the On-site Recycled Water System to ensure meeting City, CA DPH and any other applicable Regulatory Agency requirements for the use of the Recycled Water.
- 9. Adherence to the Use Area management practices as described in ARTICLE 6.
- 10. Obtaining prior authorization from Public Utilities before making any modifications to the approved On-site Recycled Water System.
- 11. Reporting all violations and emergencies to the appropriate Regulatory Agency or other local authority.
- 12. Submitting annual self-inspection reports and arranging and paying for a third-party cross-connection inspection every four years, as described in Section 6.5.

3.3. Use Area Supervisor

Use Area Supervisor Designation

The User must designate one representative to be the Use Area Supervisor of the Use Area. Use Area Supervisors represent the owner, tenant, or property manager as a liaison to Public Utilities regarding Recycled Water matters. Use Area Supervisors shall obtain instruction in the use of Recycled Water from an institution approved by CA DPH, as required by Section 7.2. Use Area Supervisors must have the authority to carry out any requirements of these Rules and Regulations. It is recommended that the Use Area Supervisor be an employee who is permanently stationed at the Use Area. At a minimum, the Use Area Supervisor must make frequent visits to the Use Area.

Use Area Supervisor Responsibilities

The Use Area Supervisor shall be responsible for the following:

 The operation, maintenance, and prevention of potential Recycled Water violations within the Use Area.

- The prevention of cross-connections between Potable Systems and On-site Recycled Water Systems.
- Being present at all cross-connection tests.
- Informing Public Utilities of all failures, violations, and emergencies that occur involving the On-site Recycled Water System.
- Knowing the provisions contained in Title 17 and the Water Recycling Criteria relating to the safe use of Recycled Water and understanding the basic concepts of backflow and cross-connection prevention, system testing, and related emergency procedures.
- Maintaining accurate records of the On-site Recycled Water System.
- Ensuring that all appropriate Use Area Personnel are properly trained in the uses of Recycled Water.
- Conducting the required annual self-inspection of the Use Area and providing a written report to Public Utilities.
- Arranging for a cross-connection test by a third party every four years and ensuring that Public Utilities receives documentation of the test, as described in Section 6.5.

Changing the Use Area Supervisor

The User must notify Public Utilities immediately of any change in personnel for the Use Area Supervisor position. In the event of a change, the new Use Area Supervisor must attend a Use Area Supervisor Certification Workshop, as described in Section 7.2, within 120 days of the position change. Failure to attend the Use Area Supervisor Certification Workshop may result in the termination of Recycled Water service.

ARTICLE 4. Facility Requirements

The purpose of this section is to provide rules and guidelines for the design, installation, and inspection of the Distribution System and On-site Recycled Water Systems. All Recycled Water systems must conform to the requirements of the UPC (Uniform Plumbing Code), Appendix J.

4.1. All Recycled Water Piping

The following are the piping requirements for the Distribution System, the Connection Service, and On-site Recycled Water Systems.

Piping Depth and Separation Requirements

 In accordance with CA DPH requirements, there shall be at least a 4-foot horizontal and 1-foot vertical separation between all pipelines transporting disinfected tertiary Recycled Water and those transporting Potable Water, with any Potable Water pipeline above the Recycled Water pipeline.

In no case is a horizontal separation of less than four feet or construction of Recycled Water facilities in the same trench as Potable Water facilities allowed.

Vertical Separation at Crossings

Where a buried constant-pressure Recycled Water pipeline crosses a buried Potable Water pipeline, it must be located a minimum of 12 inches below such Potable Water pipeline. However, constant-pressure Recycled Water pipelines are allowed to cross over Potable Water pipelines if the following conditions apply:

- 1. If there is a minimum of 4 inches vertical separation, and
- 2. If a full standard pipe length is centered over the crossing, and
- 3. If the Recycled Water pipeline is installed in a pipe sleeve that extends a minimum of 10 feet on either side of the Potable Water piping, or
- 4. If the Recycled Water pipeline is constructed of a continuous section of ductile iron pipe with hot dip bituminous coating, or
- 5. HDPE pipe with fusion-welded joints (per AWWA c906-99), or
- 6. A continuous section of Class 200 (DR 14 per AWWA C900-97) PVC pipe or equivalent, centered over the pipe being crossed, or
- 7. A continuous section of reinforced concrete pressure pipe (per AWWA c302-95) centered over the pipe being crossed.

Pipe Specifications

Pipe class specifications include the following requirements:

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

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

Depth of cover and thrust blocking

All Recycled Water system 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

Installation

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 the UPC Section 609.1.4.

Cross-connections

No physical connection shall be made or allowed to exist between any Recycled Water system and any separate system conveying Potable Water. See Section 4.4.

Supplementing Recycled Water

Supplementing Recycled Water with any other source shall not be allowed unless the connection between the two systems is protected by an air gap separation that complies with the requirements of Sections 7602(a) and 7603(a) of Title 17 and the approval of Public Utilities has been obtained.

4.2. Distribution System

Distribution System facilities and RW Service Connections shall be planned, furnished, and installed in accordance with the City's standard plans and specifications and applicable federal, state, and local statutes, ordinances, and regulations, including these Rules and Regulations. The City reserves the right to determine the location, size, and capacity of each RW Service Connection. Requests for modification or relocation of an existing RW Service Connection shall be made to Public Utilities in writing and paid for in advance.

4.3. RW Service Connections

4.3.1. Permanent RW Service Connections

General

Every RW Service Connection shall be equipped with a valve on both sides of, and adjacent to, the meter assembly. The valve on the inlet side of the meter assembly will be owned and maintained by the City and shall be used by the City to control the water supply through the meter assembly. The valve on the outlet side of the meter assembly

will be owned and maintained by the User and shall be used by the User to control the flow of Recycled Water to the Use Area. City ownership and maintenance responsibilities of the RW Service Connection include the meter assembly and terminate at, and don't include, the valve on the User's side of the meter assembly. See Figure Z for specification drawings for RW Service Connections.

Air gap

If using existing infrastructure and as appropriate, Potable Water service will be disconnected from the On-site Recycled Water System and an above-ground air gap will be installed. The air gap will be spaced so that a reduced pressure principal backflow prevention assembly can be installed in the future.

Future Connections

Due to the need to be able to quickly reconnect the On-site Recycled Water System to the previous Potable Water supply in the event of Recycled Water supply failure, the existing Potable Water system connection point will be configured to allow future connection. Reconnecting any Potable Water system will only be possible if the Recycled Water supply is disconnected from the On-site Recycled Water System.

Meter

Unless otherwise decided by the City, all RW Service Connections must be equipped with a meter assembly as described in Figure Z.

4.3.2. Temporary Potable Service Connections

In the event that Recycled Water becomes limited or is not available to a Use Area, the City may allow the User a temporary connection to a Potable Water system. Before such temporary connections are made, disconnection from the Recycled Water system shall be inspected and approved by the City and an approved reduced pressure principal backflow prevention assembly shall be required on the alternate water source. The only approved temporary connection to a Use Area using Recycled Water is the "Swivel Ell" as called out in CA DPH policy memo 2003-003. Temporary connections to the alternate source shall be removed before connection is re-established to the On-site Recycled Water System. Re-establishment of service must be inspected and approved by the City prior to resuming delivery.

4.4. Cross-connection and Backflow Prevention

4.4.1. Cross-connection Prevention

Consistent with City of Clovis Ordinance 6.5.112, no cross-connections are allowed between the Potable Water system and any other water system.

System Testing

At least every four years the User will conduct a cross-connection control test of the integrity of the On-site Recycled Water System at those Use Areas having both Potable Water service and Recycled Water service. Cross-connection tests shall be carried out as described in Section 5.5.2 and Section 6.5.2.

4.4.2. Backflow Prevention

Users shall be responsible for ensuring that all Potable Water services into Use Areas are fitted with a reduced pressure principal backflow prevention assembly if one does not already exist. The backflow prevention device must be located as close as practical to the downstream side of every Potable Water meter. Backflow prevention devices must be properly maintained and tested by the User at least annually.

4.5. On-site Recycled Water Systems

4.5.1. Use Area Site Detail Requirements

The following are the requirements of On-site Recycled Water System facilities. Before Recycled Water is delivered to a Use Area, the existing facilities shall be assessed and retrofitted, as necessary, by the User in order to meet the requirements set forth by this subsection.

The installation, modification, or construction of a new On-site Recycled Water System will be in accordance with all applicable laws, statues, rules, regulations and guidelines, including those promulgated by a Regulatory Agency. Users shall be responsible for furnishing, installing, operating, and maintaining all On-site Recycled Water Systems necessary to convey water from the valve immediately following the meter assembly to the approved Use Area in a manner that does not harm or damage any person or property. Refer to ARTICLE 3 for the respective responsibilities of the City and User regarding modifications to On-site Recycled Water Systems. In the event that any facility within the Use Area does not meet the requirement of these Rules and Regulations, Users should bring this to the attention of the City before proceeding with On-site Recycled Water System design or construction.

Plans, specifications, and drawings of On-site Recycled Water System facilities shall be submitted and approved by Public Utilities prior to commencing construction.

4.5.2. General Facilities

Piping Location and Specifications

Requirements for piping location, separation, and specifications are specified in Section 4.1.

Drinking Facilities

Drinking water facilities, such as drinking fountains, shall be protected from Overspray. Protection shall be by design, construction practices, or system operation. In some cases, the User will be required to relocate the fountains to a better location for shielding purposes. The User shall verify and ensure that no drinking fountains are inadvertently connected to the On-site Recycled Water System.

Hose Bibs

The User will identify all hose bibs on the existing irrigation systems that will carry Recycled Water. These hose bibs shall either be capped off or converted to a coupler designated for Recycled Water use. The use or installation of hose bibs within any general public access On-site Recycled Water System that operates regardless of the hose bib style, construction, or identification, is prohibited.

Picnic Tables

Wood picnic tables subject to Overspray from Recycled Water irrigation systems will be modified to the maximum extent possible to be protected from contact with Recycled Water. As applicable, the User will relocate the picnic tables, replace the tables with plastic tables, and/or paint the tabletops with a bead-up finish.

Overspray, Runoff, and Ponding

On-site Recycled Water Systems must be designed to minimize Overspray, Runoff, and Ponding. Users 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.

Protection of Aquifers

On-site Recycled Water Systems must be designed to prevent irrigation of Recycled Water within 50 feet of any domestic water supply well. In addition, Recycled Water impoundments must be located at least 100 feet (horizontal separation) from any domestic water supply well.

Backflow Prevention Requirements

No physical connection is allowed between the RW Service Connection as described in Section 4.41 and the potable water system. Backflow prevention devices are required for Potable Water systems as described in Section 4.4.2.

4.5.3. On-site Recycled Water System Specifications

4.5.3.1. Coupling and Valve Specifications

Valves

All Recycled Water valves should be of a type that can only be operated by designated Use Area Operators.

Couplers

New quick-coupling valves must be installed specifically for Recycled Water use. New quick-coupling valves must be 3/4-inch or one-inch diameter nominal size and of brass construction with a maximum working pressure of 150 psi. 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 must be installed in a valve box.

In order to prevent cross-connection or contamination by accidentally interconnecting or interchanging attachments, coupler types that are used on any Potable Water system within the Use Area shall not be used on any portions of the On-site Recycled 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; keys and attachments must not be interchangeable.

4.5.3.2. Other Valves and Devices Specifications

Sprinkler heads

All sprinkler heads shall be uniform in brand, model, and nozzle size. Sprinkler precipitation rates shall be made as uniform as practical across the Use Area. Check valves (either in-line or built into the sprinkler head assembly) shall be used to eliminate low-head drainage after the flow control valve has closed.

Irrigation Controllers

On-site Recycled Water System irrigation controllers must be automatic, with multiple start/stop times for any 24-hour period, and be installed according to the approved Record Drawings.

Flow control (recommended but not required)

Automatic flow-control devices are recommended to be used to shut down the On-site Recycled Water System if a break or other similar high flow/low pressure situation develops.

Centralized control systems, controllers that measure or can be programmed to use evaporation rates, and systems that use controls such as moisture sensors can help prevent or minimize runoff and/or Ponding.

4.5.4. Recycled Water System Identification

The exposed portions of any Recycled Water system, including all piping and appurtenances, shall be clearly identified as follows and in accordance with CA DPH requirements. The method of identification shall be clearly detailed on all Record Drawings, specifications, and engineering reports. At a minimum, all Recycled Water piping and appurtenances (including, but not limited to, valves, valve boxes, and controllers) shall be colored purple (specifically Pantone color #512, here and through out these Rules and Regulations) or distinctively wrapped in purple tape in accordance with Chapter 5. Section 116815 of the California Health and Safety Code. This does not apply to water delivered for agricultural use.

4.5.4.1. Pipe Identification

All new piping, whether for a new or retrofitted system, must be marked per these requirements to clearly distinguish between Recycled Water and Potable Water systems.

Identification of Buried Recycled Water Lines

New buried Recycled Water piping (mains and laterals) shall be of purple-colored pipe with the continuous wording "RECYCLED WATER – DO NOT DRINK" printed on opposite sides of the pipe. The pipe must be laid with the wording facing upwards. An acceptable alternative is to identify all new buried Recycled Water lines with 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 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.

Identification of Existing Buried Recycled Water Lines

Existing buried piping that 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.

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 10-foot intervals for color-coding. Purple PVC pipe is not an acceptable alternative for color-coding above-ground lines and appurtenances because the purple color will fade over time when exposed to sunlight.

Identification of Recycled Water Lines inside Structures

Exposed (not buried) constant-pressure Recycled Water pipes, 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 the UPC Appendix J, with the exception that the labeling on the piping must read "RECYCLED WATER – DO NOT DRINK." Intermittent-pressure lines inside a structure must be identified by affixing decals to this piping at 10-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.

4.5.4.2. Valve Boxes Identification

Valve boxes must have an advisory label or "nameplate" permanently molded into or affixed onto the lid with rivets, bolts, or similar. Labels must be constructed of a weatherproof material with the wording "RECYCLED WATER" permanently stamped or molded into the label.

4.5.4.3. Quick-coupling Valve Identifications

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. 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."

4.5.4.4. Other Valve and Device Identification

Isolation Valves

New and existing isolation valves must be installed in a marked valve box with a Recycled Water identification tag at the top of the valve box extension.

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.

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.

Water Meters, Pumps, Pump Control Valves, and Air/Vacuum Relief Valves

All of these Recycled Water devices must be tagged with a Recycled Water identification tag.

Recycled Water Backflow Prevention Devices

If applicable, these devices must be tagged with a Recycled Water identification tag.

Identification Tags and Stickers

Identification tags and stickers must be weatherproof and durable, such as those that are 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 ". AGUA RECICLADA – NO SE BEBA"

Irrigation Controllers

All On-site 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.

4.5.4.5. Signage Specification

All User Areas must post clearly visible signs conforming to this subsection and installed per the locations indicated on the approved Record Drawings. The User will be responsible for posting signs that notify the public of the use of Recycled Water for irrigation in areas that are accessible to the public. These signs shall be conspicuous, no smaller than 4 inches by 8 inches in area, and show an international symbol for non-Potable Water. The lettering on the signs must be a minimum of 1/2-inch in height and must be black or white on a purple background. See **Figure 1** below for an acceptable symbol. The signs will also say "RECYCLED WATER - DO NOT DRINK." The sign(s) shall be of a size easily readable by the public. The prescribed wording should also be translated and posted in Spanish ("AGUA RECICLADA – NO SE BEBA") and any other appropriate languages.



Figure 1

4.5.4.6. Required Temporary Connection to Potable Water Service

In order to prevent cross-connections, an On-site Recycled Water System is not allowed to receive Recycled Water until it has passed a required cross-connection test. This means that the On-site Recycled Water System must be supplied with water by a jumper (temporary connection) to an on-site Potable Water system up to and during the cross-connection test. The only approved temporary connection to a Use Area using Recycled Water is the "Swivel Ell" as called out in CA DPH policy memo 2003-003. After passing this test, the jumper must be removed and the system connected to the Recycled Water meter. On-site Recycled Water Systems with no Potable Water within the Use Area, such as some streetscapes and medians, do not need to conduct a cross-connection test and therefore do not need a temporary Potable Water source.

Use Areas with Fenced Facilities

Advisory signs indicating the use of Recycled Water must be installed at all entrances to the Use Area at a minimum. The City may require additional signing on a case-by-case basis.

Use Areas within Facilities Not Surrounded by Fences

Advisory signs must be placed where they can be easily seen. To the extent necessary to advise passersby, 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 irrigated streetscapes (such as parkways or frontage landscaping), signs should be placed at street corners as appropriate to notify passersby. Signs must be placed no further than 1,000 feet apart. For irrigated medians, a sign is usually placed at the midpoint of every median, and every 1,000 feet for longer median areas.

Impoundments and Other Water Bodies

The minimum requirements for impoundment signs are as follows:

Minimum wording: "This ____ [insert type of water feature here, such as "Pond", etc.] Uses Recycled Water – Do Not Drink – No Se Beba."

Minimum size: no less than 4 inches high by 8 inches wide.

Location: Must be permanently, legibly printed and posted in conspicuous places.

<u>Design</u>: Colors for lettering and background follow the same guidelines as for irrigation signs.

4.5.5. Conversion of Facilities

4.5.5.1. Conversion from Potable to Recycled Water Use

With the exception of pipe identification and pipe separation, On-site Recycled Water Systems where the existing buried piping system is converted from Potable Water to Recycled Water must meet the same requirements as new facilities. However, any new buried piping added to existing piping at a converted Use Area 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 new pipe identification requirements to the extent feasible. Prior to the conversion of an existing Potable Water system to Recycled Water use, the User shall, at a minimum submit record drawings and a report outlining the measures necessary to bring the system into full compliance to Public Utilities for review and approval. No existing Potable Water facility shall be converted to, or incorporated into, a Recycled Water facility without proper testing and approval by Public Utilities.

4.5.5.2. Conversion from Recycled to Potable Water Use

Conversion from recycled to potable water use is not allowed by the Department of Public Health under any circumstances.

ARTICLE 5. Use Area Acceptance

5.1. Request for Service

All requests for Recycled Water service must be made by an applicant (Applicant) who will be required to complete and sign the appropriate City application forms. Upon receipt, Public Utilities will review the application and, in the City's sole discretion, may prescribe special requirements and conditions that are specific to the proposed Use Area such as needed facilities, special connection requirements, and the allowable uses of Recycled Water. Such requirements and conditions will be issued in writing by the City to the Applicant.

Prior to receiving Recycled Water service, any proposed use of Recycled Water which is not explicitly permitted in the Engineering Report shall be submitted to, and approved by, CA DPH.

5.2. Pre-Application Inspection

Before the On-site Recycled Water System is designed (or converted) for Recycled Water use, each Use Area will be inspected by the City. The locations of potential Ponding, Runoff, Overspray, and other problems will be identified. The City will indicate how the On-site Recycled Water System needs be designed in order to address potential violations of these Rules and Regulations. In the event that such potential problem areas cannot be corrected by system design, the Applicant may be required to conduct and pay for a program of special inspection, monitoring, and reporting. Such special inspection and monitoring programs will identify the locations within the Use Area where potential problems (e.g. Ponding, Runoff, and Overspray) are most likely to occur, and describe the corrective monitoring, reporting and contingencies.

5.3. Design Approval

Before any new On-site Recycled Water System is constructed, or any existing On-site Recycled Water System is modified, the draft Record Drawings prepared by the Applicant must be approved by Public Utilities. Approval will be contingent upon evidence that all applicable design requirements for the Use Area are satisfied and that the On-site Recycled Water System as designed can be operated in accordance with the Rules and Regulations. While Public Utilities reviews the draft Record Drawings, the Applicant is responsible for meeting all requirements, even those requirements not shown on the approved Record Drawings for existing On-site Recycled Water System uses. Applicant shall submit to Public Utilities three sets of plans for the proposed new or revised On-site Recycled Water System on 8-1/2" X 11" or 24" X 36" size paper utilizing City Standard format. No work shall begin by User until plans have been approved by Public Utilities and fees have been paid.

5.4. Information Required On Record Drawings

The following is a list of the information required on the Record Drawings for every Use Area. Note that compliance with every item on this list does not guarantee that the draft

Record Drawings will be approved, because regulations and policies may change and some Use Areas 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.
- Show location and type of all strainers, pressure-regulating valves, and master valves.
- Show location of all water pipelines (including Potable Water lines and well discharge lines) crossing the Use Area. If space does not permit this information to be placed on the irrigation plans, then a separate Use Area or utility plan can be used to show this information. Exception: Although it may not be possible to show the location of all water pipelines for existing irrigation systems converting to Recycled Water, all locations where future Recycled Water piping must be separated from Potable Water piping must be clearly indicated on the plans.
- 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 it pertains to. Fill out the ten items as applicable, but do not delete any of them.

GENERAL USE AREA INFORMATION for RECYCLED WATER USE

- 1. LANDSCAPED RECYCLED WATER IRRIGATION USE AREA: (square footage).
- PUBLIC ACCESS TO USE AREA 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 <u>OR</u> 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. IMPOUNDMENTS OR WATER FEATURES ON USE AREA: (examples below; if none, state NONE).

Number:	Type:	Water Source:	<u>Volume:</u>
One	fountain	Recycled	400 gallons
One	pond	Potable	40,000 gallons

- Clearly identify all adjacent streets, and locations of all major improvements on the Use Area.
- Show the location of all public facilities supplied with Recycled or Potable
 Water service. Public facilities include, but are not limited to, drinking fountains,
 outdoor eating areas, restrooms, snack bars, swimming pools, wading pools,
 decorative fountains, and showers. Show the pipelines supplying all of these
 facilities.
- Show the location of any wells, lakes, ponds, reservoirs, or other **Impoundments** located within the Use Area or within 100 feet of the Use Area, and indicate the type of water source.
- Indicate that the separation between Potable and Recycled Water lines meets minimum requirements. Show sleeving and other cross-connection prevention measures where applicable.
- When Potable Water piping is not present within the Use Area, state in a note that the cross-connection test requirement is waived for Use Areas where Potable Water piping is not present.
- Show all details necessary to properly construct the On-site Recycled Water System, including the details conforming to any special requirements for the Use Area. The purpose of the details is to show the materials and methods necessary to clearly identify all water systems within the Use Area.
- Include an **irrigation equipment legend** specifying all materials of construction for the On-site Recycled Water 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 quickcoupling valves with purple covers where Recycled Water is used.
- Include the **Standard Notes** specified by the City.
- Show the proposed locations for all **Recycled Water signs** on the irrigation plans.
- Add signature lines for Applicant and Public Utilities to all irrigation plan sheets, detail sheets, and specification sheets that pertain to the On-Site Recycled Water System.

5.5. Acceptance Inspection

5.5.1. Construction Inspection

Public Utilities will conduct on-site inspections during the construction phase of the On-site Recycled Water Systems to ensure that materials, installation, and procedures are in accordance with the approved Record Drawings, specifications, and all applicable regulations. Accordingly, the Applicant must notify Public Utilities of the schedule for all phases of planning, construction and start-up so that inspections can be scheduled.

The inspection criteria for all Recycled Water piping must conform to the requirements of the UPC Sections 103.5.1 through 103.5.4.2.

5.5.2. Cross-connection Test

The Applicant must pass a cross-connection test before connecting the On-site Recycled Water System to the Distribution System at any Use Area where both Recycled and Potable Water are present within the Use Area. This test is to ensure the absolute separation of the Recycled and Potable Water systems. The Applicant must notify Public Utilities at least 48 hours prior to the test so that a City representative may be present. The City will notify the DPH of the test date and the opportunity to be present. The cross-connection test must be done under the supervision of Public Utilities and performed by an AWWA-certified cross-connection control specialist hired by the Applicant. The Use Area Supervisor must be present at the test. The test must be done with Potable Water supplying the On-site Recycled Water System (see Required Temporary Connection to Potable Water Service within Section 4.5.4.6). A written report documenting the test results must be submitted by the certified cross-connection control specialist to the Use Area Supervisor and Public Utilities following test completion.

5.5.3. Final Inspection and Approval to Receive Recycled Water

Before the On-site Recycled Water System is connected to Recycled Water, Public Utilities will perform a final inspection to ensure all requirements have been met. This inspection may be coordinated with the cross-connection test. The Public Utilities inspector will check to see that the proper equipment was used and that all required tags, labels, and signs are in place.

Public Utilities must grant final approval before Recycled Water can be supplied to the Use Area. Final approval will be granted when construction has been completed in accordance with approved Record Drawings, all cross-connection tests have been performed, a final on-site inspection has been conducted, and all requirements have been met satisfactorily. After the User Agreement is finalized by Public Utilities and all applicable fees have been paid, Public Utilities will finalize the installation of the RW Service Connection with the service meter assembly. Upon request, CA DPH will be provided with a copy of all test and inspection reports as well as notification that Recycled Water service has started. During the lifetime of the On-site Recycled Water System, Public Utilities will periodically inspect the Use Area to ensure compliance with all applicable Rules and Regulations.

5.5.4. Coverage Test

Users are responsible for minimizing Overspray, Runoff, and Ponding from their On-site Recycled Water System. To ensure that the User is doing so, Public Utilities will conduct an inspection of the On-site Recycled Water System. After the On-site Recycled Water System begins receiving Recycled Water, the User must contact Public Utilities to schedule a coverage test walk-through of the system. The Use Area Supervisor must be in attendance. If modifications to the system (other than minor adjustments) are required, the User 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 User, and the User must pay all costs associated with such modifications.

5.5.5. Record Drawings

The Applicant must provide Record Drawings to show On-site Recycled Water System as constructed. These drawings must include any and 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 Public Utilities before the Applicant implements the changes in the construction contract. The On-site Recycled Water System record drawings must be submitted to Public Utilities within ninety (90) days of the Use Area receiving Recycled Water.

5.6. User Agreement Issuance and Renewal

5.6.1. Recycled Water User Agreement

Upon approval of the application by the City, a non-transferable User Agreement shall be executed between the City and Applicant authorizing the Applicant to receive Recycled Water service subject to the terms and conditions of these Rules and Regulations and federal, state, and Regulatory Agency rules and regulations. The User Agreement shall include, but not be limited to, the Use Area location, an estimate of the quantity (including seasonal schedule) of Recycled Water to be used, and permitted uses of Recycled Water.

5.6.2. Temporary User Agreements

Prior to receiving Recycled Water service, the User will be issued a 120-day temporary User Agreement by Public Utilities after passing the acceptance inspection. The User must designate a Use Area Supervisor who is responsible for attending the Site Supervisor Certification Training (see Section 7.2) before the temporary User Agreement expires. Once a Use Area Supervisor has attended the training and provided documentation of his/her attendance, Public Utilities will issue Applicant a standard User Agreement.

5.6.3. User Agreement Renewal

If a portion or all of the Use Area property is transferred to a new owner or tenant, or a new Use Area Supervisor becomes responsible for On-site Recycled Water System maintenance, the User must notify Public Utilities within 30 days in order to receive a new User Agreement.

ARTICLE 6. Operation, Maintenance, and Management

The operation, maintenance and management of Use Areas are the responsibilities of Users while the operation and maintenance of the Distribution System, including the RW Service Connection, is the responsibility of the Public Utilities. The following operation, maintenance, and management requirements satisfy the requirements of the Water Recycling Criteria.

6.1. General Requirements

The following general requirements may pertain to both the City and the Users, as applicable, for Recycled Water system components within their respective purview.

- 1. The use of Recycled Water must be limited to the Use Areas designated and approved by the City.
- 2. A Use Area Supervisor shall be designated, as required by Section 3.3 of this document.
- 3. Runoff of Recycled Water and Overspray shall be prevented or minimized. Runoff and Overspray shall be regularly monitored by the User. Any Runoff, Ponding, or Overspray shall be corrected immediately by the User. Adequate measures shall be taken to minimize Ponding and to prevent breeding of mosquitoes of public health significance.
- 4. Drinking water facilities, such as drinking fountains, shall be protected from Overspray. Protection shall be by design, construction practices, or system operation.
- 5. Users will be responsible for continuous maintenance of the On-site Recycled Water System. This includes, but is not limited to,
 - Testing pressures periodically with a pressure gauge to maintain appropriate pressure levels. Valves or pressure regulators should be adjusted so that the systems are operating at the pressure required by the sprinkler heads or emitters
 - Routine testing the accuracy of time clocks. Time clocks should be recalibrated or repaired as necessary.
 - Repair or replacement of broken risers, sprinklers, valves, or other appurtenances as soon as the damage is discovered. These should be replaced with the appropriate make and model of equipment to maintain uniformity throughout the On-site Recycled Water System.
- 6. Users shall ensure that all On-site Recycled Water System facilities are maintained, operated, and repaired at all times in a manner that does not cause illness or injury to any person, and in a manner that does not cause damage or injury to the real or personal property or any person or entity, including the City.
- 7. Recycled Water identification signs, tags, stickers, and above-grade pipe markings shall be regularly checked for proper placement and legibility as described in Section 4.5.4. Damaged, unreadable, or missing signs, tags, stickers, and pipe markings shall be repaired or replaced by the User.

- 8. Use Areas shall be managed so that public contact with Recycled Water is minimized.
- 9. The use of Recycled Water shall at no time create odors, slime, or deposits, become a public or private nuisance.
- 10. All reduced pressure principal backflow prevention assemblies, pumps, and other mechanical devices must be inspected quarterly for leaks and shall be repaired or replaced as necessary.
- 11. Screens and backwash filters shall be routinely cleaned to keep the On-site Recycled Water System operating optimally.
- 12. Users shall provide written notification, in a timely manner, to Public Utilities of any material change or proposed change in the character of the use of Recycled Water.
- 13. Users shall provide written notification, in a timely manner, to Public Utilities of any material modification or proposed modification to an On-site Recycled Water 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 User if any additional approval is required from other regulatory agencies and if disinfecting procedures are required.
- 14. Users will maintain accurate records of all inspections, modifications, and repair work.
- 15. In the event of a break in the On-site Recycled Water System, low pressure, low flow or poor water quality, the User will notify Public Utilities.
- 16. Users will notify Public Utilities immediately of any and all failures in the system resulting in an Unauthorized Discharge or contamination of a Potable Water system. Any incident concerning Recycled Water use that may involve public illness must be reported to CA DPH and to Public Utilities. Public Utilities will specify if a written report is required. In the event of an Unauthorized Discharge, the Use Area Supervisor should make every effort to contain the Recycled Water and prevent it from leaving the Use Area or entering into a Potable Water system. Emergency cross-connection procedures are described in Section 6.6.2.
- 17. Potable Water shall be provided for workers as required by law.
- 18. Toilet and washing facilities shall be provided for workers as required by law.
- 19. A first-aid kit should be available on site, to prevent any cuts and other injuries incurred from contacting Recycled Water.
- 20. A copy of these Rules and Regulations, an On-site Recycled Water System layout map, and an On-site Recycled Water System operations manual shall be made available to Use Area Operators at all times. A copy of the User Agreement and these Rules and Regulations shall be maintained at the User's facilities and be available at all times for inspection by Regional Water Board staff, the City and DPH staff.

6.2. Irrigation-specific Requirements

 Sprinkler heads shall be adjusted so they achieve 80% head-to-head coverage throughout their intended arc. There should be no obstruction that would interfere with the free rotation and smooth operation of any sprinkler, such as trees, tall grass, shrubs, or signs. The system should be tested during the daytime so adjustments can be made.

- 2. Valves or pressure regulators shall be adjusted so that irrigation systems are operated at the appropriate pressure for the sprinkler heads or emitters.
- 3. The duration or length of an irrigation cycle (run time) should be no longer than the time necessary to saturate the soil's root zone.
- 4. There shall be no Recycled Water irrigation within 50 feet of any well for domestic supply unless all of the following conditions have been met:
 - a. A geological investigation demonstrates that an aquitard exists at the well between the uppermost aquifer being drawn from and the ground surface;
 - b. The well contains an annular seal that extends from the surface into the aquitard;
 - c. The well is housed to prevent any Overspray from coming into contact with the wellhead facilities;
 - d. The ground surface immediately around the wellhead is contoured to allow surface water to drain away from the well; and
 - e. The owner of the well approves of the elimination of the 50-foot buffer zone requirement noted above.

6.3. Impoundment-specific Requirements

- 1. The use of Impoundments supplied by Recycled Water shall be specified by individual User Agreement and shall be limited to:
 - 1. Golf Course ponds
 - 2. Decorative ponds or water features in housing or commercial developments
 - 3. Others as approved by Public Utilities and CA DPH.
- 2. Impoundments shall not occur within 100 feet of any domestic water supply well.
- 3. Impoundments shall be lined and their construction approved and inspected by the City.
- 4. User should develop a maintenance program to help prevent the growth of algae subject to approval by the City, which may include but is not limited to adequate aeration, circulation, and chemical application.

6.4. Management Recommendations

The following practices are recommended, although not required, by these Rules and Regulations, to optimize management of On-site Recycled Water Systems:

- 1. Use tensiometers, gypsum blocks, soil probes, the "feel method," and/or the California Irrigation Management Information System to estimate soil moisture levels. Inspect and maintain any selected instrumentation regularly to ensure the accuracy and reliability of these methods.
- 2. Use automatic rain shut-off devices to reduce irrigation if significant rainfall occurs.
- 3. Use multiple rain shut-off devices to reduce Ponding if the precipitation rate is higher than the infiltration rate of the soil.
- 4. Group irrigated areas into zones of similar water use. For example, irrigate grass areas separately from shrub areas and sunny areas separately from shady areas.

- 5. As needed, aerate the soil to improve infiltration of air and water into the soil.
- Provide as much flexibility as possible into the design of the On-site Recycled Water System. Built-in ability to make changes as necessary can add to the efficiency of the system.
- 7. Perform good horticultural, fertilization, mowing, de-thatching, aeration, and pest control practices, as necessary, to create the best growing environment for landscape vegetation.

6.5. Scheduled Inspections and Tests

6.5.1. Annual Self-inspection Report

Users shall conduct an inspection at least once per year while the On-site Recycled Water System is in use. The results of this inspection must be documented and submitted in a written report to Public Utilities, based on a report form to be mailed to each Use Area Supervisor by Public Utilities once a year. Each Use Area Supervisor must submit the results of the observations, along with a description of any corrective actions taken. Each Use Area Supervisor must keep a copy of the report for his/her records and return the original to Public Utilities. The questions on the annual inspection report are as follows:

- Is there evidence of Recycled Water Runoff from the Use Area? Show affected area on a sketch and estimate flow rate and daily volume.
- Is there an odor of wastewater originating from within the Use Area? If yes, indicate apparent source, characterization, direction of travel, and any public use areas or off-site facilities potentially affected by the odors.
- Is there evidence of Recycled Water Ponding, and/or evidence of mosquitoes breeding within the irrigation area due to ponded water?
- Are warning signs, tags, stickers, and above-ground pipe markings properly posted to inform the public that irrigation water is Recycled Water, which is not suitable for drinking? Are these signs in all the appropriate languages based on the community in which the Use Area is located?
- Is there evidence of leaks or breaks in the On-site Recycled Water System piping or tubing?
- Is there evidence of broken or otherwise faulty irrigation system emitters or sprinklers?
- Has your designated Use Area Supervisor changed in the past year?
- Have any other operational or management changes been implemented at the Use Area that represent differences from the terms, conditions, and other provisions of your Use Area Agreement?
- What corrective actions are being taken to correct any problems noted above?

In addition, all reduced pressure principal backflow prevention assemblies for potable connections must be tested at least annually. The User is responsible for hiring an AWWA-certified backflow prevention device tester to perform the device testing. Test reports must be included with the Annual Self-inspection Report.

6.5.2. Cross-connection Tests

Once every four years, the User must have a cross-connection test at their cost performed by an AWWA-certified cross-connection control specialist to verify that there is not a cross-connection between any Recycled Water and Potable Water systems. The test must be performed in accordance with Appendix X. The certified cross-connection control specialist must submit a written report documenting the test results to the Use Area Supervisor and the City.

6.6. Emergency Procedures

6.6.1. General Requirements

In case of earthquake, flood, fire, major freeze, nearby construction, or other incident that could cause damage to the Recycled Water or Potable Water systems, the Use Area Supervisor must inspect all Potable Water systems and the On-site Recycled Water System for damage as soon as it is safe to do so. If either system appears damaged, both systems should be shut off at their points of connection. The Use Area Supervisor must immediately contact Public Utilities for further instruction.

To prevent contamination, damage, or a public health hazard, the User may make emergency modifications or repairs without the prior approval of the City. As soon as possible after the modification, but within 24 hours, the User must notify the City of the emergency modifications and file a written report within three days.

6.6.2. 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.

- The User must notify the Public Utilities by telephone immediately. 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 if different from the Use
 Area Supervisor.
- 2. Public Utilities will notify CA DPH and other regulatory agencies, as appropriate, of the reported cross-connection.
- 3. User must immediately shut down the Recycled Water supply to the On-site Recycled Water System.
- 4. User must keep Potable Water systems pressurized and post "Do Not Drink" signs at all Potable Water fixtures and outlets.
- 5. User must provide bottled water for employees until water from the Potable Water system is again deemed safe to drink.
- 6. After final approval has been obtained from CA DPH, the City will bring the Recycled Water back into service and inform the User to remove the "Do Not Drink" signs from Potable Water fixtures and outlets.

ARTICLE 7. Employee Training Requirements

7.1. General Requirements

Employee training shall be implemented and sustained by Users to assure safe and proper operation of the On-site Recycled Water System. The training programs shall be site-specific, fully compliant with these Rules and Regulations, and shall be implemented prior to the receipt of Recycled Water.

The Use Area's training program shall be developed by the Applicant and described in an attachment to the User Agreement. The training program description will identify the entity that will provide the training, identify all entities that will receive the training, and address all of the following requirements:

- 1. Use Area Personnel, residents, and the public shall be made aware that Recycled Water is not approved for drinking purposes.
- Use Area Personnel and others must be notified that Recycled Water is in use, through the posting of signs, and the other means required by these Rules and Regulations.
- Use Area Personnel shall be instructed against taking food into areas that are still wet with Recycled Water or consuming food that may have come in contact with Recycled Water.
- 4. The Use Area will maintain a copy of all applicable Recycled Water rules, regulations and reports, an On-site Recycled Water System layout map, and an On-site Recycled Water System operational manual.
- 5. All Use Area Operators will be familiar with, and have access at all times to, written maintenance instructions, irrigation schedules, controller charts, record drawings, and these Rules and Regulations.
- 6. Training shall be provided to all Use Area Personnel before Recycled Water is delivered to the Use Area, as an orientation for new Use Area Personnel, and as an annual refresher course for all Use Area Operators. At a minimum, the training should convey the following information:
 - a. Recycled Water, although highly treated, is non-potable and must never be used for human consumption.
 - b. Regulations prohibit Ponding, Overspray, and Runoff of Recycled Water.
 - c. Working with Recycled Water is safe if common sense is used and the Rules and Regulations are followed.
 - State law prohibits a connection between the Recycled Water and Potable Water systems.
- 7. The training program should instruct Use Area Operators in proper procedures for reporting Unauthorized Discharges, identifying and correcting cross-connections, and isolating and/or repairing the On-site Recycled Water System in the event or an earthquake or other disaster.

7.2. Use Area Supervisor Training

The Use Area Supervisor must pay for and attend a Use Area Supervisor Certification Workshop from an institution approved by CA DPH and the City, within the first 120 days of receiving Recycled Water service. Failure to attend the Use Area Supervisor Certification Workshop may result in the termination of Recycled Water service.

ARTICLE 8. Recycled Water Service

8.1. General Statement

The City shall provide Recycled Water on a case-by-case basis where the City determines Recycled Water is technically and economically feasible. Providing Recycled Water service shall be at the discretion of the City. Determination of the allowable uses of Recycled Water shall be in accordance with the treatment standards and water quality requirements set forth in the State of California's Water Recycling Criteria and with the intent to protect the public health. Recycled Water service shall, in addition, be subject to the availability of distribution facilities or the technical and economic feasibility of making such facilities available, as determined by City. No person or entity other than the City shall deliver Recycled Water to a Use Area.

8.2. Conditions of Service

Recycled Water service will be made available to the User under the following terms and conditions:

8.2.1. Compliance with Regulations

Recycled Water shall be used in a manner that complies with all applicable federal, state, and local statutes, ordinances, regulations and other applicable requirements for the treatment level supplied, as determined by City. The use of Recycled Water shall not, at any time, cause pollution, contamination, or a private or public nuisance, as defined by section 13050 of the California Water Code, Division 7 (Water Code). Recycled Water shall be used by Users at all times in a manner that does not cause illness or injury to any person and in a manner that does not harm or damage any real or personal property of any person or entity, including the City.

8.2.2. Distribution

The City reserves the right to control and schedule distribution of Recycled Water as necessary to:

- 1) Safeguard public health;
- 2) Maintain acceptable working pressure;
- 3) Manage the availability of Recycled Water supply; and
- 4) Construct, maintain, and operate City facilities.

8.2.3. Metering

All Recycled Water use shall be metered, and all Recycled Water used on any Use Area where a meter is installed must pass through said meter, which will be installed, calibrated and maintained by the City. Users shall be held responsible, and charged, for all Recycled Water passing through the meter(s), unless otherwise specified by the City.

8.2.4. Temporary Connections

If Recycled Water becomes limited or is not available to a Use Area, the City may approve a temporary connection to a Potable Water system in the City's sole discretion. Switching the On-site Recycled Water System from a Recycled Water to a Potable Water supply must conform with the requirements of Section 4.3.2.

8.3. Charges for Service

The schedule of Recycled Water rates, service charges, and other charges will be established by City of Clovis Ordinance 08-21 or any amendments thereto.

8.4. Disputed Recycled Water Bills

Any dispute over the accuracy of a Recycled Water bills shall be governed by City of Clovis Ordinance.

8.5. Non-Registering Recycled Water Meter

When a meter is found to be out of order, the charge for Recycled Water will be governed by City of Clovis Ordinance.

ARTICLE 9. Enforcement

Wherever applicable, City of Clovis Ordinance 08-21 shall govern in matters that require the enforcement of rules pertaining to Recycled Water. In addition the City may, in its sole discretion, employ any of the following enforcement procedures in order to return a User to compliance with a User Agreement, these Rules and Regulations or any federal, state, or local regulation.

9.1. Investigations and Initial Determination

Authorized representatives of the City, the Regional Board, or CA DPH, upon presentation of proper credentials, shall have the right to enter Use Areas during reasonable hours, for any of the following reasons:

- Monitoring and inspecting On-site Recycled Water Systems to ascertain compliance with these Rules and Regulations and other regulatory requirements.
- Installing, maintaining, repairing, and/or collecting measurements from Cityowned facilities serving the Use Area. Where necessary, keys and/or lock combinations shall be provided to the City for Use Area access during normal business hours.

The City shall investigate all reports of non-compliance to any provision of these Rules and Regulations and/or the User Agreement to determine the validity and seriousness of the violation. Determination regarding the seriousness will be based upon:

- 1. The magnitude and duration of the violation;
- 2. Its effect on public health, the environment, City property or assets, or the operation of the Distribution System;
- 3. Its effect on the City's compliance with the rules and regulations of the regulatory agencies with which it must in turn comply; and
- 4. The history and good faith of the User.

9.2. Informal Enforcement Procedures

The City, at its sole discretion, may choose to notify a User of the violation without enacting formal enforcement procedures. The City will specify the period to correct the violation, along with a date for a follow-up inspection to verify the violation has been fully corrected. In the event the User does not take appropriate corrective action within the time specified by the City, the City may commence formal enforcement procedures, including, but not limited to, suspending Recycled Water service, or pursue all other remedies provided by law or by the User Agreement.

9.3. Formal Enforcement Procedures

9.3.1. Notice of Violation

As long as there is not an emergency, as determined by the City, the User will receive a written notice of violation describing:

- 1) The nature of the violation;
- 2) Requirements for submittal of a corrective action plan;
- 3) Setting a reasonable time limit for the satisfactory mitigation of the violation; and
- 4) A date for a follow-up inspection.

The User may file a notice of objection within 10 working days after notice of violation is received specifying the reasons for the objection. City's initial determination will be final in the event:

- 1) The User fails to file an objection within the time period allotted; or
- 2) The objection cannot be resolved to the mutual satisfaction of the User and the City, wherein the User can then file an appeal as provided herein below. This notice of violation procedure shall be in addition to any other remedies available to the City.

9.3.2. Termination of Service

The City may terminate service to a User who uses Recycled Water or manages the On-site Recycled Water System in violation of these Rules and Regulations or in violation of any Regulatory Agency rules and regulations. In cases where the serious nature of the violation requires immediate action, the City may, at its discretion, suspend the Recycled Water service immediately and without notice. The City may also elect to inform the Regional Board and/or CA DPH depending on the nature of the violation. The Regional Board or CA DPH may initiate enforcement action, which may include fines, against any User who discharges, uses, manages, transports, or stores Recycled Water in violation of any applicable discharge requirement prescribed by the Regional Board or in a manner that creates or threatens to create conditions of pollution, contamination, or nuisance, as defined in Water Code, Section 13050. In such cases the City shall notify the User of the corrective actions necessary to re-instate Recycled Water service. The City will specify the deadline for correcting the violation, along with a date for a follow-up inspection to verify the violation has been fully corrected.

9.3.3. Non-compliance Following Formal Enforcement

Failure to cease all violations within the stated time period may result in the City terminating the User Agreement as well as pursuing any other remedies provided by law or by the User Agreement.

ARTICLE 10. Service Termination

10.1. Turn-off at User's Request

A User may request that service be discontinued, either temporarily or permanently, by giving at least two working days advance notice to the City. The User assumes full responsibility for all charges incurred from the effective date of service until User notifies the City to discontinue service.

10.2. Turn-off by the City

The City may discontinue a User's service for any of the following reasons:

- 1. <u>Non-Payment of Bills</u> Service may be discontinued for nonpayment of any water charges by a User subject to the terms of the User Agreement.
- Non-Compliance Service may be discontinued for non-compliance with the terms and conditions of the User Agreement, as specified in the User Agreement.
- 3. Water Quality Service may be discontinued if, at any point in the City's Distribution System, the Recycled Water does not meet the quality requirements of the City or a Regulatory Agency. Service would, in such case, be restored at such time as Recycled Water again meets the quality requirements or at such time as the City supplements the Recycled Water system with water from other sources.
- 4. For Non-Compliance With Regulations Service may be suspended or terminated in the manner provided herein at any time the User's operations do not conform to these Rules and Regulations as determined by the City in its sole discretion. Where safety of water supply or public health is endangered, or Regulatory Agency regulations have been violated, service may be suspended immediately without notice. Otherwise, all defects noted shall be corrected within the period of time specified by the City.
- For Waste of Water In order to protect against serious and negligent waste or misuse of Recycled Water, the City may suspend service if such wasteful practices are not remedied after notice to such effect has been given to the User.
- 6. <u>For Unauthorized Use of Recycled Water</u> When the City has discovered an unauthorized use, the service may be suspended without notice. Any person obtaining Recycled Water without City approval will be liable as described in Section 1.5.3.

10.3. Re-Establishment of Service

The City shall have the right to refuse to re-establish service following termination of service for violation of these Rules and Regulations or the terms of a User Agreement. Any request to re-establish service subsequent to the termination of Recycled Water service shall be in the manner prescribed for initially obtaining Recycled Water service from the City. In order to resume or continue service that has been suspended, the

City of Clovis	Page 40 of 41	Recycled Water Program
the City.		
User may be required, at the City's	discretion, to pay a restora	ation fee, as determined by
3		
Rules and Regulations		

APPENDIX X

Cross-connection Control Test Procedure for On-site Recycled Water Systems

The following is the required methodology for conducting cross-connection control tests for Use Areas where both Recycled Water and Potable Water are intended to be used in separate piping systems. A certified AWWA Cross-connection Specialist must perform the test.

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.

CROSS-CONNECTION CONTROL TEST PART I:

The Potable Water system shall be activated and pressurized. The On-site Recycled Water System shall be shut down at its point of connection to the Distribution System and depressurized — this is usually done by manually bleeding a control valve and/or quick-coupling valve that is located at the lowest point of elevation in the On-site Recycled Water System.

- Any proximate Potable Water systems shall remain pressurized for a minimum period of time specified by the Cross-connection Specialist while the On-site Recycled Water System is depressurized. The minimum period of time the On-site Recycled Water System is to remain depressurized shall be determined on a caseby-case basis, taking into account the size and complexity of the Potable Water system and the On-site Recycled Water System.
- 2. All On-site Recycled Water System control valves and quick-coupling valves, irrigation systems, and impoundment inlets shall be tested and inspected for flow. If the On-site Recycled Water System has been truly shut down at its point of connection, then continuous flow from any part of the On-site Recycled Water System indicates a cross-connection.
- 3. All Potable Water fixtures (interior and exterior)—faucets, hose bibs, drinking fountains, toilets and urinals, supply lines to decorative fountains, etc.—shall be tested and inspected for flow. No flow from a particular Potable Water outlet indicates that it may be connected to the On-site Recycled Water System, and therefore constitutes a cross-connection to be remedied.
- 4. If no cross-connections are discovered, proceed to the second part of the test. If any cross-connections are found, they must be disconnected, and the Use Area must be re-tested by an AWWA Cross-connection Specialist per these procedures, that is, beginning again with Part I of the Cross-connection Control Test.

CROSS-CONNECTION CONTROL TEST PART II:

1. The Potable Water system shall be shut down at its point of connection (usually the City-controlled valve immediately preceding the meter assembly) and depressurized. In the case of a Potable Water system in a multi-story building, the Potable Water

- system pressure may be reduced by the amount deemed necessary by the Crossconnection Specialist and monitored with a gauge installed at a low point of elevation in the Potable Water system.
- 2. The On-site Recycled Water System shall then be activated and pressurized.
- 3. The On-site Recycled Water System shall remain pressurized for a minimum period of time specified by the Cross-connection Control Specialist while the Potable Water system is depressurized (or, in the case of a multi-story building Potable Water system, remains in a state of reduced pressure). The minimum period of time the Potable Water system is to remain depressurized shall be determined by the Crossconnection Control Specialist on a case by case basis.
- 5. All Potable Water fixtures (interior and exterior)—faucets, hose bibs, drinking fountains, toilets and urinals, supply lines to decorative fountains, etc.—shall be tested and inspected for flow. Some flow may occur from water breaking loose from an air lock in an overhead water line. The amount of flow to cause a concern shall be determined by the Cross-connection Specialist. If the Potable Water system has been truly shut down at its point of connection, then continuous flow from any part of the Potable Water system (that is beyond the drainage generated by an air lock breaking free) indicates a cross-connection. In the case of a Potable Water system in a multi-story building, the testing of all fixtures may be used in combination with a pressure gauge (as mentioned in Step No. 1. above), or the pressure gauge may be used instead of the testing of all fixtures. If the Potable Water system has been truly shut down at its point of connection, then an increase in the Potable Water system pressure viewed at the gauge over a period of time specified by the Cross-connection Specialist indicates a cross-connection with the Recycled Water System.
- 6. All On-site Recycled Water System control valves, quick-coupling valves, and any other approved Use Area facilities (such as supply lines to impoundments), shall be tested and inspected for flow. No flow from any particular On-site Recycled Water System control valve, quick-coupling valve, or any other Recycled Water fixture indicates that it may be connected to the Potable Water system, and therefore constitutes a cross-connection to be remedied.
- 7. If no cross-connections are discovered, then the Potable Water system shall be repressurized. If any cross-connections are found, they must be disconnected, and the On-site Recycled Water System must be re-tested by a Cross-connection Control Specialist per these procedures, that is, beginning again with Part I of the Cross-connection Control Test.

The Cross-connection Control Specialist responsible for completing the above test(s) must indicate the results on a City of Clovis Cross-connection Notification Form and return it to Public Utilities.

Appendix Y References

- California Code of Regulations (CCR), Title 22, Division 4, Chapter 3, "Water Recycling Criteria" - CA DPH regulations that specify the acceptable uses of Recycled Water and the requirements for Recycled Water use areas. Water Recycling Criteria regulations govern both Distribution Systems and On-site Recycled Water Systems.
- 2. California Code of Regulations (CCR), Title 17, Division 1, Chapter 5, Group 4 "Drinking Water Supplies"- Title 17 specifies requirements intended to protect public drinking water supplies from contamination. Some requirements specified in Title 17 include specifications for backflow prevention devices, designation of a Recycled Water site supervisor, and requirements for cross-connection testing.
- 3. California Water Code, Division 7 "Water Code" Also known as the *Porter-Cologne Water Quality Control Act*, this legislation finds the people of California have a primary interest in the conservation, control, and utilization of water resources and that the quality of water shall be protected by the state. The legislature assigns primary responsibility for the coordination and control of environmental water quality to the State Water Resources Control Board and each Regional Water Quality Control Board.
- 4. International Association of Plumbing & Mechanical Officials (IAPMO) Uniform Plumbing Code, Section 103.5 and Appendix J Appendix J of the Uniform Plumbing Code sets forth requirements when Recycled Water is used within buildings in a dual-plumbed system for non-potable domestic uses, such as toilet and urinal flushing. This section of the Uniform Plumbing Code does not apply to irrigation sites, where the recycled water system is located outside buildings, or to industrial sites, where the Recycled Water is used for non-domestic industrial purposes. The pipe separation regulations indicated in this Rules and Regulations document may be different from, and take precedence over, the Appendix J requirements.
- 5. California Regional Water Quality Control Board, Central Valley Region ("Regional Board") – The Regional Board is the regional branch of the agency responsible for preserving the quality of California's water resources. Amongst other responsibilities, the Regional Board is responsible for issuing National Pollutant Discharge Elimination System (NPDES) permits, which regulate wastewater discharges to surface waters.
- 6. State of California Department of Public Health "CA DPH" The CA DPH is responsible for protecting and promoting the safety of California's drinking water. Specific to the City's recycled water program, CA DPH is responsible for developing the criteria and regulations for Recycled Water use, evaluating and approving Recycled Water systems, and for making recommendations to the Regional Board regarding the public health implications of Recycled Water use.

Figure Z
RW Service Connection
Drawing

