

Appendix M

Recycled Water

This appendix describes the various aspects of municipal recycled water to support completion of the UWMP recycled water section and tables discussed in Section 5. The appendix provides clarification on how to define and document recycled water in the 2015 UWMPs, as well as additional background information which may be helpful for understanding recycled water and, in turn, completing the wastewater and recycled water requirements in the 2015 UWMPs.

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Status of Recycled Water in California

Recycled water as a water supply has the ability to provide additional locally-available and locally-controlled water resources. It has been safely reused in California for over 100 years and the state, as of 2009, is annually reusing 669,000 AF to meet water supply needs. Although this is a significant amount of water, there is potential to increase this amount and provide greater local water supply reliability.

Recycled Water Definition

Municipal recycled water is wastewater that has been treated to a specified quality to enable it to be used again. As defined in Water Code Section 13050(n), recycled water means *water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use*

that would not otherwise occur and is therefor considered a valuable resource. Although the legal definition does not specify the source of water, in common use “recycled water” refers to water originating as municipal wastewater, and it is the reuse of that wastewater that is tracked in UWMPs.

There are two requirements treated municipal water must meet to be classified as recycled water in UWMPs. It must be reused:

- Beneficially, in a manner consistent with recycled water criteria in Title 22 of the California Code of Regulations
- In accordance with a Regional Water Quality Control Board (RWQCB) permit, such as National Pollutant Discharge Elimination System (NPDES), waste discharge requirements (WDR), or water recycling requirements (WRR)

The terms “recycled water” and “reclaimed water” have the same meaning and can be used interchangeably. However, recycled water is used more commonly and implies a municipal wastewater source. The process by which a facility (industrial or otherwise) uses process water multiple times is usually referred to as internal reuse to distinguish it from municipal recycled water.

The quality of most water discharged from a wastewater facility in the state of California is suitable to be recycled for some beneficial use. Recycled water encompasses a range of water qualities, depending on the level of treatment provided at the wastewater facility. The distinction between discharged or disposed wastewater effluent and recycled water is the act of the planned beneficial reuse that makes the treated effluent ‘recycled water’. The term “recycled water” indicates a beneficial use after wastewater treatment. It does not mean or imply a certain level of treatment, such as “tertiary-treatment.”

Municipal wastewater originates primarily from domestic (household) sources, but it can include commercial, industrial, and institutional (CII) wastewater discharged to a sanitary sewer. Industrial water is considered municipal recycled water when it is comingled with other municipal wastewater or treated by a municipal wastewater treatment facility. Industrial wastewater that is separately treated and reused is not categorized as municipal recycled water.

Title 22

Title 22 (California Code of Regulations, Division 4, Chapter 3, §60301 et seq.) is the regulation overseeing reuse or “recycling” of municipal wastewater to protect public health. Level of treatment and bacteriological water quality standards are used in Title 22 to define what uses are legally allowed, based on the probability of public contact to protect public health. Title 22 identifies uses for a range of wastewater treatment levels, from undisinfected secondary treatment through water that has undergone advanced treatment. Title 22 regulations also specify monitoring and reporting requirements and onsite use area requirements.

The SWRCB's Division of Drinking Water (DDW, before July 1, 2014 within the California Department of Public Health) administers the adoption of Title 22 regulations and oversees their application. The applicable provisions of Title 22 are incorporated into permits issued by the Regional Water Quality Control Boards (RWQCB) or statewide general permits issued by the State Water Resource Control Board (SWRCB). These permits are the mechanism for enforcement of Title 22 regulations.

Levels of Treatment

Municipal wastewater that can be beneficially reused is classified by its level of treatment in accordance with Title 22. Primary-treated water, that which has removed 70 to 85 percent of the organic and inorganic solids through either settling or floating, is not able to be recycled in California. When reporting level of treatment in Tables 6-3 and 6-4, one of the five treatment categories specified in Title 22 are to be used. The specific requirements for each level of treatment are included in Title 22, but are briefly summarized, as follows:

- Secondary, Undisinfected (California Code of Regulations, CCR §60301.900) – oxidized wastewater.
- Secondary, Disinfected-23 (CCR §60301.225) - Oxidized and disinfected wastewater.
- Secondary, Disinfected-2.2 (CCR §60301.220) - Oxidized and disinfected to a higher level than Secondary, Disinfected-23.
- Tertiary (CCR §60301.230) – Oxidized, filtered, and disinfected wastewater to achieve both bacterial and virus removal.
- Advanced (CCR §60320.201) - Treatment technologies beyond conventional coagulation, filtration and disinfection, including reverse osmosis, micro- or nanofiltration, ozonation, or advanced oxidation. Refer to the CCR for specific requirements.

Figure M-1 (from California Water Plan Update 2013, DWR 2014) summarizes uses allowed for levels of municipal recycled water treatment specified in Title 22. While Title 22 lists specific allowed uses, other uses are permitted and approved on a case-by-case evaluation by the State Water Resources Control Board's DDW. Examples of other specific allowed non-potable recycled water applications are geothermal power production and carpet-dyeing. In general, the linkage between level of recycled water treatment and potential uses specified in Title 22 is strongly influenced by the potential for direct human contact and ingestion, with higher levels of treatment (tertiary or advanced) required for open public access and worker contact conditions.

A key component of incorporating municipal recycled water into water supply is aligning potential uses to the availability of various levels of treated municipal recycled water. Determining municipal recycled water availability requires coordination with both the local water and wastewater agencies, because each jurisdiction has its own roles, authorities, and service areas with respect to municipal recycled water generation and distribution.

Disposal Versus Recycling

There are three situations where there may be misconceptions about the distinction between wastewater disposal and recycled water:

- Release of treated municipal wastewater into a receiving water body
- Land application of treated municipal wastewater onto a field for the primary purpose of disposal
- Treated wastewater percolation ponds

Once the treatment process is complete and the effluent is released into a receiving water body, the effluent becomes part of the receiving water body and is considered disposal unless there is a contractual arrangement to use the river to convey the treated water from the discharger to a downstream user. If a downstream user extracts water from the water body without a contractual relationship with the upstream discharger, the reuse of the treated effluent would be considered an incidental use (see below for further discussion of incidental use).

If a wastewater treatment plant uses land application to dispose of its treated effluent, how the irrigated field is subsequently used distinguishes whether the disposal can also be considered as water recycling. If the field has a planned use for pastureland or crop cultivation, then the effluent would be classified as recycling for agricultural irrigation. If there is no use of the field, then the effluent discharge is considered disposal without recycling.

Percolation disposal ponds may be adding water to a usable aquifer, but that incidental recharge is not a planned purpose of such ponds and these ponds are not regulated as a water supply source. Thus, percolation from disposal ponds is not counted as groundwater recharge or recycled water use.

Direct Versus Indirect Use

Direct beneficial use is defined in the Code of California Regulations § 60301.200 *as the use of recycled water that has been transported from the point of treatment or production to the point of use without an intervening discharge to waters of the State*. Direct reuse involves a conveyance structure, such as a pipe or canal, to take treated wastewater from the point of treatment to the point of use. Typically, treated wastewater is discharged into rivers and streams as part of permitted disposal practices. Discharged water then commingles with the stream or river that may be a water source for downstream communities or agricultural users. These downstream uses are considered indirect reuse. Groundwater recharge and surface water augmentation with recycled water are two forms of planned indirect reuse for potable use, which are discussed further below.

Planned Versus Unplanned Beneficial Uses

Treated municipal wastewater is integrated into California's water supply through both planned and unplanned applications. A planned reuse is an intentional use of recycled water without

relinquishing control. Planned reuses are generally identified in planning studies and permit applications. They also generally involve agreement between the recycled water supplier and the recycled water user. An unplanned reuse occurs when water is discharged and subsequently reused by an entity that is not the discharger without a continuity of custody of the water. Indirect reuse is often also unplanned reuse, with the major exception of indirect potable reuse, which is discussed below. Nonpotable indirect reuse may also be planned if treated wastewater is discharged — usually into a surface water body — and there is prearranged agreement or intention between the producer and user that treated wastewater discharge will be maintained in specified quantities and times for use by downstream diverters. Discharged treated wastewater supplements river flow and can be a downstream benefit for wetland or aquatic habitat, or withdrawn by a downstream river water user. In the case of the latter, the wastewater discharge is regulated to protect the all beneficial uses of the receiving water (Recycled Water Task Force 2003). The instream benefits of treated wastewater discharge and indirect reuse by downstream diversions are both important components of managing California’s water resources, but they are distinguished from planned reuse.

Potable Versus Non-potable Reuse

Non-potable recycling includes any application not involving drinking water for human consumption, such as landscape or agricultural irrigation, commercial applications like car washes or dual-plumbed office buildings, or industrial process such as oil refineries or cooling towers. Examples of nonpotable uses are given in the Beneficial Uses section below. Potable reuse results in augmentation to drinking water supplies. Potable reuse can be either direct reuse or indirect reuse (see below).

Direct Potable and Indirect Potable Reuse

Direct potable reuse is the planned introduction of recycled water either directly into a public water system, as defined in Section 116275 of the Health and Safety Code, or into a raw water supply immediately upstream of a water treatment plant. Direct potable reuse is a practice which is not currently occurring in California.

Indirect potable reuse occurs when tertiary or advanced treated wastewater augments drinking water resources. The two types of indirect potable reuse are:

- Indirect potable reuse for groundwater recharge - where recycled water recharges a groundwater basin and groundwater is later extracted from the basin
- Surface water augmentation – where recycled water is added into a surface water reservoir used as a source of domestic drinking water supply

Potable use does not actually occur until the water is subsequently pumped from the ground or withdrawn from the reservoir, treated, and added to the drinking water distribution system. Because seawater intrusion barriers typically result in groundwater recharge, they may be considered a form of indirect potable reuse.

Indirect potable reuse through groundwater recharge has occurred in California since 1962. Title 22, Division 4, Chapter 3, Article 5.1 (CCR §60320 *et seq*) describes the permitting and monitoring process required to obtain a RWQCB permit for groundwater recharge.

Indirect potable reuse through surface water augmentation is not currently permitted in California, but regulations are being drafted and are expected to be completed by December 31, 2016. Like groundwater recharge with recycled water, surface water augmentation will only occur with a permit and monitoring requirements from a RWQCB.

The feasibility of implementing direct potable reuse in California is currently being reviewed by an expert panel supported by the DDW. It is required to provide recommendations to the DDW by December 2016 to:

- Advise DDW on public health issues and scientific and technical matters regarding the feasibility of developing uniform water recycling criteria for direct potable reuse.
- Assess what, if any, additional areas of research are needed to be able to establish uniform water recycling criteria for direct potable reuse.

Supplemental Water

Supplemental water is water added to a recycled water system to meet peak demands when the supply of recycled water cannot meet demands. Supplemental water may also be added to recycled water systems during interruptions in the recycled water supply or to a groundwater recharge project as a required blend with tertiary-treated water.

Supplemental water can be potable or non-potable. If a supplier adds supplemental water to its recycled water system, the volume of supplemental water is not to be included in the volumes of recycled water provided by UWMP preparers in Tables 6-4 and 6-5, but is to be included as a separate line in Table 6-4.

Quantifying recycled water production and use within the area considered by the UWMP

The focus of the discussion of recycled water in an UWMP is to be the volume of wastewater generated and treated and the amount of recycled water beneficially reused within the service area. This can be a straight-forward assessment when there is one utility that provides both water and water services within a service area. It can get very complicated in larger urban areas where cities abut each other and independent suppliers provide regional services. For example, wastewater generated within a service area is not always treated within the service area or recycled water used in a service area may have been generated in another service area.

Guidance on collection and treatment scenarios and how an UWMP preparer should approach completing Tables 6-2 and 6-3 is provided at the end of this section.

Estimating versus Metering

Table 6-2 summarizes wastewater volumes collected within the service area. Because wastewater volumes frequently are not metered, it may be necessary to estimate values. For this table, indicate in the appropriate column whether the values provided are from estimated or metered data. It is assumed that the volumes in the remaining tables summarizing wastewater and recycling will be metered data with the exception of Table 6-6 (methods to increase recycled water use).

Involved Agencies

The guidebook requests a summary list of agencies or organizations involved in the collection, treatment, or discharge of wastewater. This list should also include recycled water agencies and may consider organizations involved but not directly participating in the treatment process, such as groups operating a wetland or participants in memoranda of understanding. It could also include contracted operations as well as joint venture participants. It is likely that many of these organizations would be part of the overall UWMP outreach effort.

Wholesaler vs Retailer

A recycled water wholesaler is an organization that distributes recycled water to another organization that is not an end user. A wholesaler obtains the recycled water fully-treated from another agency, may provide additional treatment to partially-treated wastewater, or may provide all treatment of wastewater. A recycled water retailer distributes recycled water to end users. An agency may also be both a wholesaler and a retailer if it has direct customers which use recycled water and provides recycled water to another organization that distributes it to end users in that service area.

Internal Reuse

Wastewater facilities frequently internally reuse partially- or fully-treated, non-potable water within their facilities for equipment cleaning or minor landscaping. This is a similar practice to industrial internal reuse. Although this internal reuse is a beneficial use, internal industrial or wastewater treatment reuse should not be included with other recycled uses in Table 6-3, 6-4, or 6-5.

If a wastewater plant uses treated effluent for onsite landscape irrigation at a treatment plant where public access is not restricted, that volume should be entered in Table 6-4 as landscape irrigation. The table should also include treated wastewater used offsite for sewer system maintenance, such as sewer line flushing (included in the 'other' category).

Coordination of UWMP and the 2015 Recycled Water Survey Data

The SWRCB and DWR are conducting a statewide survey of all municipal recycled water beneficial use for the 2015 calendar year, with the intent that data from the survey will be

coordinated with that provided in the UWMPs. This will enable a subsequent, interagency, comprehensive analysis of statewide recycling of municipal wastewater. This coordinated collection of data for dual purposes should streamline the survey process, support consistent data reporting, and facilitate water supply planning.

The two agencies are working closely together and have developed uniform definitions and data collection approaches to facilitate this data collection effort. In this 'two-pronged' effort, the SWRCB's survey will focus on the wastewater producers, with DWR's UWMPs focusing on the potable water suppliers. Beneficial use classifications and definitions (see below) are consistent between the two efforts.

Recycled water information provided in the UWMPs will provide more information on specific uses and system background information than the volumes provided by the wastewater producers. Pairing of the efforts by the two agencies is hoped to benefit the recycled water users and producers, as well as the state agencies responsible for overseeing recycled water use in the state.

It is expected that the SWRCB electronic survey request will be provided to the wastewater producers early in 2016. Because UWMPs will be in preparation at that time, an UWMP preparer may be able to coordinate directly with the wastewater producers for some of the information requested in the UWMPs. If a wastewater plant provides recycled water to areas supplied by multiple water suppliers, data will have to be disaggregated by water supplier service area for UWMP preparers. If a UWMP preparer does not have the information on the wastewater agency contact for the recycled water survey, that information can be obtained from DWR.

Beneficial Uses

The term beneficial uses applies to almost every aspect of water use in California. California Water Code §13050(f) specifies *"beneficial uses" of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.*

For the purposes of recycled water, California Water Code 10633(d) specifies that a UWMP must contain a *description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.* UWMP preparers are requested to review the descriptions, provided below, of the recycled water beneficial uses to be quantified and apply them to completing the tables

summarizing recycled water use for their service area. Recycled water does not have to offset potable demand to be considered beneficially reused.

For the 2015 survey, reported volumes are to be categorized by use, instead of the user type. For example, if a commercial or industrial customer (such as an apartment building or industrial park) is using all of its recycled for landscape irrigation, the use type should be landscape irrigation. If the commercial user estimates that 75% of its water use is for landscape irrigation and 25% for process water, and does not have separate recycled water meters for interior and exterior water use, the reported use would be landscape irrigation. If the same commercial user has two separate meters, the metered value for each would be classified according to its use – 75% for landscape irrigation and 25 % for commercial use.

The quantified data provided for the beneficial uses by the recycled water provider must be for uses authorized by a permit issued by a RWQCB or SWRCB for waste discharge or water recycling. Volumes indicated in Tables 6-4 and 6-5 should be consistent with that permit.

An “other” category is included in Tables 6-4 and 6-5. However, it is intended that the category only be used if there is no other appropriate category. A category of water use, institutional water use, is used in water use accounting but is not used in recycled water use accounting. An institutional water user is a water user dedicated to public service, including but not limited to, higher education institutions, schools, courts, churches, prisons, hospitals, government facilities, and non-profit institutions. Recycled water used by institutional water users is to be included with the type of use and will generally be landscape irrigation, golf course irrigation, agricultural irrigation, or ‘other’ categories.

The following provides specific definitions of each beneficial use classification.

Agricultural Irrigation

Irrigation of food, fiber, and fodder crops, and pastureland. This also includes christmas tree production, pasture for farm animals , and wholesale plant nurseries.

Landscape Irrigation (excluding Golf Courses)

Irrigation of parks, schools, cemeteries, churches, residential, streetscapes, slope protection, or public facilities. Golf course irrigation is not included. Water to maintain aesthetic impoundments within landscaped areas is included with landscape irrigation. Fill stations primarily used for public use should be classified as landscape irrigation.

Golf Course Irrigation

Irrigation of golf courses, whether publically or privately held. Water used to maintain aesthetic impoundments within golf courses is also included with golf course irrigation.

Commercial Use

Uses by commercial water users, except landscape irrigation. A commercial water user is a water user that provides or distributes a product or service. Examples of commercial water use

are: commercial building use (toilets, HVAC, etc.), car washes, laundries, and retail nurseries. Landscape irrigation of commercial building areas is to be classified as landscape irrigation if it is separately metered or if landscape is the dominant use of mixed uses served by a single meter. Fill stations, if they are primarily used for commercial use, should be classified as commercial use. Landscape irrigation on golf courses should be reported as golf course irrigation. Fill stations primarily used for public use should be classified as landscape irrigation.

Industrial Use

Uses by industrial water users, except landscape irrigation and geothermal energy production. An industrial user is a water user that is primarily a manufacturer or processor of materials. Examples of industrial water uses are cooling towers, oil refining, process water, and mining. Landscape irrigation of industrial building areas is to be classified as landscape irrigation if it is separately metered or if landscape is the dominant use of mixed uses served by a single meter.

Geothermal and Other Energy Production

Water used to augment geothermal zones or used in the energy industry, excluding refineries. Refinery use is classified as industrial.

Seawater Intrusion Barrier

Injected water in coastline setting designed to reduce seawater intrusion into a coastal aquifer with a seawater interface.

Recreational Impoundment

Addition of water to maintain water levels in a lake for recreation or other non-potable uses. Lakes for wildlife habitat are included in the natural systems/restoration category. Small impoundments that are features in parks or golf courses are included as part of landscape irrigation or golf course irrigation.

Natural Systems/Restoration

Any water provided to a designated wildlife area, whether included as part of a wastewater facilities treatment process or an independent area. The area must be designated as a wetland or wildlife area and so does NOT include water that a wastewater facility must discharge to maintain habitat in the creek to which it is discharging. This category also includes recycled water used at wetlands, wildlife habitats and refuges, and duck clubs.

Groundwater Recharge (IPR)

Addition of water to augment groundwater aquifers for future use. Only groundwater recharge projects that are permitted by the state or regional board for the purpose of groundwater recharge is accounted for in this category. A water agency cannot claim as planned groundwater recharge treated wastewater incidentally recharging groundwater as a result of leakage from evaporation/percolation ponds.

When recycled water is blended with other water sources within the recharge system, only the amount of recycled water is to be reported in Tables 6-4 and 6-5.

Surface Water Augmentation (IPR)

Surface water augmentation is defined in the CWC as *the planned placement of recycled water into a surface water reservoir used as a source of domestic drinking water supply* (CWC §13561). Surface water augmentation is not allowed in California at this time (see above), so 2015 recycled water use cannot be classified as surface water augmentation. However, regulations for its implementation are being prepared by the SWRCB's DDW, so projects may be permitted and implemented by 2020. In Table 6-4, surface water augmentation may be considered a future beneficial use in 2020 and thereafter.

Direct Potable Reuse

Direct potable reuse is defined in the CWC as *the planned introduction of recycled water either directly into a public water system or into a raw water supply immediately upstream of a water treatment plant* (CWC §13561). This use is currently not permitted in the State of California, but its feasibility is being assessed by an expert panel supported by the SWRCB's DDW. A time frame for permitting and implementing direct potable reuse projects is uncertain at this time, but a water supplier may be considering and planning for its enactment. In Table 6-4, direct potable reuse may be considered a future beneficial use in 2020 or thereafter, but it is not certain that regulations allowing implementation will be in place.

Other

If a recycled water use cannot be classified into one of the categories identified above, an UWMP preparer may use this category. However, how the recycled water is used must be identified and described in Table 6-4. Sewer system flushing and firefighting are two possible uses that could be classified as 'other'. Fill stations should not be classified as 'other'. If the fill station was primarily used by commercial users for dust control or other purposes, fill station use should be classified as 'commercial'. If the majority was used by landscapers or residential customers, then the use should be classified as 'landscape irrigation'.

Recycled Water Use and Urban Per Capita Water Use Targets

Urban water suppliers may exclude recycled water use for the purpose of setting and meeting per capita water use targets. The amounts of recycled water excluded must be calculated in accordance with the methodologies in Section 5 and these amounts may not coincide with the amounts of recycled water reported in Tables 6-4 and 6-5.

Fit For Purpose

A concept that organizations may find useful for increasing recycled water use within the UWMP area is a concept referred to as 'fit for purpose' (U.S. Environmental Protection Agency 2012). The basis of this concept is that the level of wastewater treatment should be commensurate with the uses of recycled water to ensure adequate treatment to meet the needs of users or protect public health while avoiding excessive treatment and associated costs. More rigorous treatment (and more energy-intensive processes) is reserved for uses with higher human or food production contact to minimize pathogen or harmful chemical contact. Conversely, less-

treated wastewater has been safely used for decades in many agricultural reuse applications, which is the largest category of recycled water use in California. Greater reuse of secondary-treated wastewater in agriculture and environmental settings, where additional “natural treatment” through exposure to sunlight and soil contact can augment wastewater plant treatment, may provide additional opportunities for expanding recycled water use. Finally, water suppliers may determine that having available multiple levels of treated wastewater may support increased integration of recycled water use into their water supply portfolio. For example, West Basin Municipal Water District is successfully providing multiple water quality levels of recycled water to its customers to meet specific needs of its diverse customer base.

Tables

Three to five tables addressing wastewater and recycled water are required to be completed for each UWMP. Three tables (6-2, 6-3, and 6-6) are to be completed in each UWMP. If recycled water is being used in an UWMP area or is planned to be during the planning horizon of the UWMP (required to be 20 years, but may be 25 at the discretion of the UWMP preparer), then Tables 6-4 and 6-5 must also be completed. Table 6-6 is required to show actions water suppliers have considered to begin or increase use of recycled water. Additional guidance for completing each table is included here.

**Table 6-2
Wastewater Generated Within Service Area in 2015**

| row | column | A | B | C | D | E | F | G |
|-----|--------|--|-----------------------------|----------------------|------------------------------------|---|----------------------------------|---|
| | | Table 6-2 Retail: Wastewater Generated Within Service Area in 2015 | | | | | | |
| 1 | | Percentage of 2015 service area covered by wastewater collection system | | | | | | |
| 2 | | Percentage of 2015 service area population covered by wastewater collection system | | | | | | |
| | | Wastewater Collection Agency | Wastewater Treatment Agency | Treatment Plant Name | Is WWTP Located Within UWMP Area?* | Is WWTP Operation Contracted to a Third Party? (optional) | Was Volume Metered or Estimated? | Volume of Wastewater Collected from the Service Area 2015 |
| | | | | | <i>yes/no</i> | <i>yes/no</i> | <i>meter/est</i> | |
| 3 | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| 4 | | Total Wastewater Collected from Service Area: | | | | | | 0 |

This table is to be completed by each UWMP preparer for all wastewater COLLECTED within the UWMP area.

Rows

| | |
|-------|---|
| Row 1 | Using the 2015 size of the UWMP area, identify what percentage (to the nearest whole number) of the service area is covered by sewer service. |
| Row 2 | Using the 2015 population determined for the gpcd calculations (Section 5), identify what percentage (to the nearest whole number) of the population is covered by sewer service. |
| Row 3 | Use as many rows as needed. For each collection agency and WWTP within the UWMP service area, provide the requested information |
| Row 4 | Add the total amount of wastewater generated in 2015 within the UWMP area |

Columns

| | |
|----------|---|
| Column A | Enter the names (one per row) of each wastewater collection agency |
| Column B | Enter the names (one per row) of each agency receiving collected wastewater and then treating it |
| Column C | Enter the names of the wastewater facility treating the wastewater produced within the UWMP area |
| Column D | Drop Down Menu - Enter "yes" or "no" |
| Column E | Drop Down Menu - Enter "yes" or "no" |
| Column F | Drop Down Menu - Enter "metered" or "estimated" for the method used to determine flow. |
| Column G | Enter the volume of wastewater PRODUCED within the UWMP area and treated at the wastewater facility |

Table 6-3
Wastewater Treatment and Discharge Within Service Area in 2015

| column | A | B | C | D | E | F | G | H | I | J | K |
|--------|--|---------------------------------------|--------------------------------|---|--------------------|--|-----------------|--------------------|-------------------------------|------------------------------|----------------------------------|
| row | Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015 | | | | | | | | | | |
| | Wastewater Treatment Plant Name | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number (optional) | Method of Disposal | Does This Plant Treat Wastewater Generated Outside the Service Area? | Treatment Level | 2015 volumes | | | |
| | | | | | | | | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area |
| 1 | | | | | drop down menu | yes/no | drop down menu | | | | |
| 2 | Total | | | | | | | 0 | 0 | 0 | 0 |

This table is to be completed for all wastewater TREATED OR DISPOSED within the UWMP area. If neither occurs, the table does not have to be completed.

Rows

| | |
|-------|--|
| Row 1 | Use as many rows as needed. Multiple rows can be used for one treatment plant, if different quality waters are produced, or if there are multiple discharge locations or Wastewater Discharge IDs. For each WWTP and non-recycled wastewater discharged within the UWMP service area, provide the requested information. |
| Row 2 | Add the total amount of wastewater generated in 2015 within the UWMP area. The values in the highlighted cells are what should be reported in Tables 6-3 and 6-4. |

Columns

| | |
|----------|--|
| Column A | Enter the names (one per row) of each wastewater treatment plant or discharge location within the UWMP area. |
| Column B | Enter the name or descriptive identifier of each wastewater discharge location. |
| Column C | Enter additional discharge location description information, such as a water body name or specific geographic coordinates. |
| Column D | Enter the Waste Discharge identifier number issued by the state or regional water control board for the facility or discharge location. If this information is not available to the UWMP preparer, please contact Toni Pezzetti at DWR (tpezzett@water.ca.gov). |
| Column E | Drop Down Menu - Enter the method of disposal |
| Column F | Drop Down Menu - Enter "yes" or "no", indicating whether wastewater generated from outside the UWMP area was treated at this facility. |
| Column G | Drop Down Menu - Enter the treatment level of the discharge (defined by Title 22) at the time of release. If multiple treatment levels occur, use additional rows (one per treatment level). |
| Column H | Enter the total volume of water treated at the wastewater facility associated with the discharge location. If more than one row is used to fully account for different levels of wastewater treatment and/or discharge locations, only enter total wastewater for the facility once. |
| Column I | Enter the volume to treated wastewater that was not recycled and was discharged to the environment at the discharge location. |
| Column J | Enter the volume of recycled water used within the service area. If more than one treatment level of recycled water is used, use more than one row. |
| Column K | Enter the volume of recycled water produced within the service area, but transported for use to another area that is included in the UWMP of a different water supplier. |



Letters correspond to the Table 6-3 columns

Table 6-4
Current and Projected Recycled Water Direct Beneficial Uses Within Service Area

| row | column | A | B | C | D | E | F | G | H | I | J |
|-----|--------|--|----------------------------------|--------------------|------|------|------|------|------|------------|---|
| | | Table 6-4 Retail or Wholesale: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area* | | | | | | | | | |
| 1 | | Name of Agency Producing (Treating) the Recycled Water: | | | | | | | | | |
| 2 | | Name of Agency Operating the Recycled Water Distribution System: | | | | | | | | | |
| 3 | | Supplemental Water Added in 2015 | | | | | | | | | |
| 4 | | Source of 2015 Supplemental Water | | | | | | | | | |
| | | Beneficial Use Type | General Description of 2015 Uses | Level of Treatment | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 (opt) | |
| 5 | | Retailer Name | | drop down menu | | | | | | | |
| | | Retailer Name | | | | | | | | | |
| | | Retailer Name | | | | | | | | | |
| 6 | | Agricultural irrigation | | | | | | | | | |
| | | Landscape irrigation (exc golf courses) | | | | | | | | | |
| | | Golf course irrigation | | | | | | | | | |
| | | Commercial use | | | | | | | | | |
| | | Industrial use | | | | | | | | | |
| | | Geothermal and other energy production | | | | | | | | | |
| | | Seawater intrusion barrier | | | | | | | | | |
| | | Recreational impoundment | | | | | | | | | |
| | | Wetlands or wildlife habitat | | | | | | | | | |
| | | Groundwater recharge (IPR) | | | | | | | | | |
| 7 | | Surface water augmentation (IPR) | | | | | | | | | |
| | | Direct potable reuse | | | | | | | | | |
| | | Other | use type | | | | | | | | |
| | | Total: | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | IPR - Indirect Potable Reuse | | | | | | | | | |

This table is to be completed for all recycled water USED within the UWMP area. If recycled water is not or planned to be used, the table does not have to be completed.

NOTE: If recycled water within the UWMP area is supplied by more than one entity operating separate systems, the UWMP preparer should duplicate this table so that each system is reported in its own table. If recycled water is obtained from multiple suppliers but operated within a single system, please provide the total amount of recycled water obtained in 2015 from each provider in Row 1, but report the use numbers in a single table.

Rows

| | |
|-------|--|
| Row 1 | Identify the name of the agency treating the recycled water used in the UWMP area. If more than one entity supplies recycled water into a single distribution system, indicate each supplier's 2015 total. For example, Supplier A (250 AF) and Supplier B (125 AF). |
| Row 2 | Identify the name of the agency distributing recycled water within the UWMP area. Only one recycled water supplier should be included within each table. |
| Row 3 | Enter the volume of supplemental water (i.e., non-recycled water) added to the recycled water system in 2015. |
| Row 4 | Enter the source of the supplemental water (i.e., untreated groundwater, potable water, etc.) |
| Row 5 | List each retail recycled water supplier within the service area, with the associated level of treatment, receiving water for distribution to other users. It is not necessary to provide any description of how the retailer uses the recycled water. If water of different qualities is provided to a single retailer, use multiple lines to indicate the volume for each quality. |
| Row 6 | Provide the actual and projected uses for the identified uses of recycled water. Definitions for each beneficial use is included below. For 'surface water augmentation' and 'direct potable reuse', entry of 2015 use is not allowed because these uses are currently not permitted. Regulations are currently being written for surface water augmentation and can be entered for 2020 and beyond. The feasibility of implementing direct potable reuse in California is being evaluated. It is not known if it will be a permitted practice after 2020, but a water supplier may choose to plan for its use after 2020. The 'other' category is to be used for uses that are not classified by any of the provided use types. Some 'other' use types may include fire fighting, fill stations, dust control, etc. If a water supplier has multiple 'other' uses, additional lines can be inserted. For each 'other' use, identify the use type in Column B and a brief description in Column C. |
| Row 7 | Add the total amount of recycled water used in 2015 (shown in Row 6) or planned to be used in the future within the UWMP area. The values in the highlighted cell should equal the value of the sum of the highlighted cells in Table 6-3. |

Columns

| | |
|------------|--|
| Column A | Enter the names (one per row) of each retail agency receiving recycled water from the recycled water system. |
| Column B | Enter the specific use of recycled water included in the 'other' category. |
| Column C | Provide additional information on the types of recycled water uses included in the beneficial use type. For example, identify the types of crops irrigated with recycled water in 2015, the types of commercial uses, or the name of the recreational impoundments using recycled water. |
| Column D | Identify the level of treatment for the recycled water use, using the drop-down menu. If multiple qualities are used, indicate each on a separate row. |
| Column E | Enter the volume being beneficially reused for the 2015, using the category descriptions below. |
| Column F-J | Enter the volume expected to be beneficially reused for the subsequent planning years. 2040 is an optional year. |

See Appendix M, pages M-8 through M-11 for definition and discussion of each beneficial use type

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**Table 6-5
2010 UWMP Use Projection Compared to 2015 Actual**

| | | | | | |
|--------|---|---|---------------------------------|------------------------|---|
| column | | A | B | C | |
| row | | Table 6-5 Retail: 2010 UWMP Use Projection Compared to 2015 Actual | | | |
| | | Use type | 2010 Projection for 2015 | 2015 actual use | |
| 1 | | Sales to Other Agencies | | | |
| | | Agricultural irrigation | | | |
| | | Landscape irrigation (ex golf courses) | | | |
| | | Golf course irrigation | | | |
| | | Commercial use | | | |
| | | Industrial use | | | |
| | | Geothermal and other energy production | | | |
| | | Seawater intrusion barrier | | | |
| | | Recreational impoundment | | | |
| | | Wetlands or wildlife habitat | | | |
| | | Groundwater recharge (IPR) | | | |
| | | Other | <i>use type</i> | | |
| | 2 | | Total | 0 | 0 |

This table is to be completed for all recycled water USED within the UWMP area. If recycled water was not used in 2015 and was not projected in the 2010 UWMP for 2015, the table does not have to be completed.

Rows

| | |
|-------|---|
| Row 1 | Provide the actual and projected uses for the identified uses of recycled water. Definitions for each beneficial use are provided in the instructions for Table 6-4. 'Surface water augmentation' and 'direct potable reuse' are not shown in this table because they are currently not permitted. The 'other' category is to be used for uses that are not classified by any of the provided use types and are to be the same as those shown in Table 6-4. |
| Row 2 | Add the total amount of recycled water used in 2015. The values in the highlighted cell should equal the value of the sum of the highlighted cells in Table 6-3 or the highlighted cell in Table 6-4 |

Columns

| | |
|----------|--|
| Column A | Enter the specific use of recycled water included in the 'other' category. For Actual 2015, they are to be the same as those shown in Table 6-4. |
| Column B | Enter the 2015 volumes predicted in the 2010 UWMP |
| Column C | Enter the volume actually used in 2015 for each use type. This Column should be identical to the 2015 data shown in Table 6-4. |

**Table 6-6
Methods to Expand Future Recycled Water Use**

| | | | | |
|--------|--|--------------------|------------------------------------|--|
| column | A | B | C | D |
| row | Table 6-6 Retail: Methods to Expand Future Recycled Water Use | | | |
| | Actions | Description | Planned Implementation Year | Expected Increase in Recycled Water Use |
| 1 | name of action | | | |
| | name of action | | | |
| | name of action | | | |
| 2 | Total | | | 0 |

This table is to be completed by UWMP preparers if recycled water is or is not planned to be used.

Rows

| | |
|-------|---|
| Row 1 | Identify specific actions planned to be taken to increase the use of recycled water within the UWMP area. These may include specific programs such as onsite retrofit support, price reduction per unit volume of recycled water, increased discussion with potential users of recycled water, changes in the permitting to expand user or use area, or development of joint projects with regional partners. |
| Row 2 | Add the expected increase in volume of recycled water use this is expected to result in. |

Columns

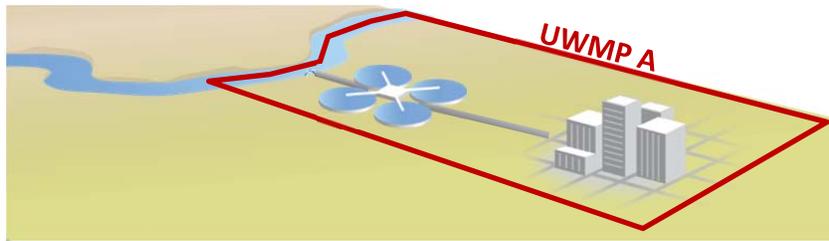
| | |
|----------|--|
| Column A | Identify the name of the action |
| Column B | Provide a brief description of the action |
| Column C | Identify the approximate year to implement the action. A range of years may be entered. |
| Column D | Provide a general estimate (or detailed one, if available) of the increase in recycled water use resulting from implementing the action. |

**Figure M-1
Summary of Most Recycled Water Uses Approved Under Title 22**

| Water Use Key: | | | | | |
|--|--|--|--|--|------------------------|
| Agricultural Irrigation | Urban Irrigation | Other Urban Uses | Commercial and Industrial | Impoundments | Indirect Potable Reuse |
| Advanced^c | | | | | |
| <ul style="list-style-type: none"> Advanced treated recycled water is now defined in the June 18, 2014, revision of Title 22 and is used for groundwater recharge, including groundwater injection for salinity barriers. Advanced treatment also will be considered as part of the surface reservoir augmentation and direct potable reuse efforts to be completed as part of SB 918 and SB 322. | | | | | |
| Disinfected Tertiary | | | | | |
| <ul style="list-style-type: none"> Residential landscaping Golf courses Parks and playgrounds School yards Any other irrigation not specified in Title 22 and not prohibited by other California Water Code regulations | <ul style="list-style-type: none"> Decorative fountains Toilet/Urinal flushing Structural firefighting | <ul style="list-style-type: none"> Laundries Cooling or air conditioning Artificial snow-making Process water that may contact workers Car washes | <ul style="list-style-type: none"> Recreational impoundments | <ul style="list-style-type: none"> Groundwater recharge or salinity barrier injection allowed with case-by-case permits by RWQCBs | |
| Disinfected Secondary-2.2^d | | | | | |
| <ul style="list-style-type: none"> Food crops with surface irrigation, food portion above-ground and not in contact with recycled water | | | <ul style="list-style-type: none"> Restricted recreational impoundments Publicly accessible fish hatcheries | | |
| Disinfected Secondary-23^d | | | | | |
| <ul style="list-style-type: none"> Pastures for milk animals with human consumption Non-edible vegetation with access control Nurseries and sod farms with unrestricted access | <ul style="list-style-type: none"> Cemeteries Freeway landscaping Golf courses with restricted access | <ul style="list-style-type: none"> Dust control Road cleaning Non-structural firefighting | <ul style="list-style-type: none"> Boiler feedwater Mixing concrete Some types of cooling or air conditioning Soil compaction Process water not in contact with workers | <ul style="list-style-type: none"> Landscape impoundments without decorative fountains | |
| Undisinfected Secondary | | | | | |
| <ul style="list-style-type: none"> Fodder and fiber crops Seed crops not eaten by humans Non-food-bearing trees | <ul style="list-style-type: none"> Nurseries and sod farms, with limitations Food crops processed before human consumption | <ul style="list-style-type: none"> Orchards or vineyards with no contact between edible portion and recycled water | <ul style="list-style-type: none"> Sanitary sewer flushing | | |

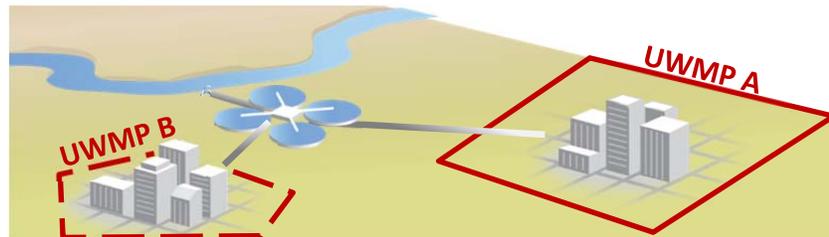
- Based on California Code of Regulations Title 22, Section 60001 et seq.
- Uses for increasing levels of treatment also include all uses for lower treatment levels.
- Wastewater treated with reverse osmosis and advanced oxidation processes.
- Recycled water with a median concentration of total coliform bacteria not exceeding a most probable number of 2.2 or 23 per 100 milliliters (see California Code of Regulations, Title 22).

Figure M-2
Collection and Treatment Scenarios for Completing Table 6-2



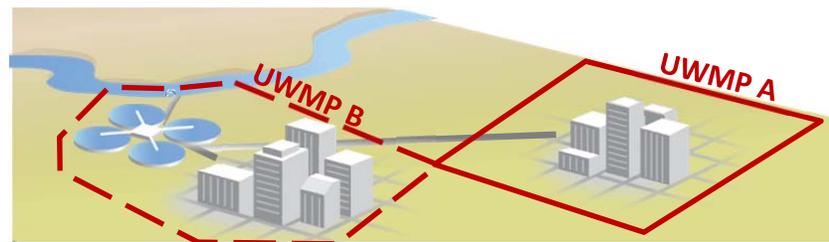
TS1: The UWMP preparer is responsible for collecting, treating, and disposing of the wastewater generated within its service area.

- Complete Tables 6-3



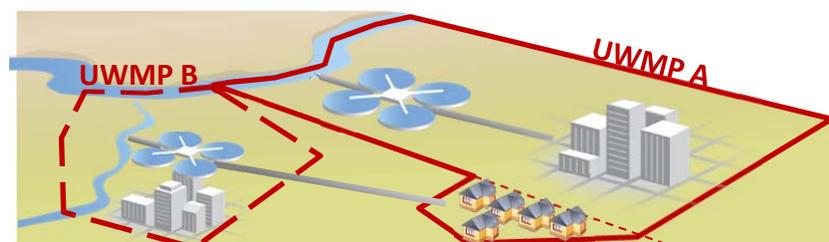
TS2: The UWMP preparer does not treat or dispose of the wastewater generated within its service area. Wastewater is treated and disposed by an organization that does not prepare an UWMP.

- Provide narrative description on wastewater disposal (treatment level and location)



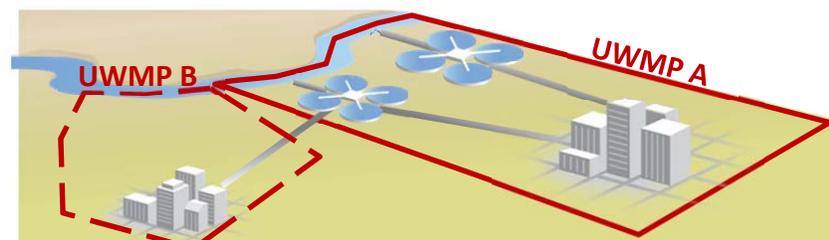
TS3: The UWMP preparer does not treat or dispose of the wastewater generated within its service area. Wastewater is conveyed for treatment to another entity which also prepares an UWMP.

- Provide narrative description on wastewater disposal and the name of the UWMP that applies to the plant receiving the effluent



TS4: A portion of the wastewater collected in UWMP preparer's area is conveyed for treatment to another entity which also prepares an UWMP.

- Complete Table 6-3 for the wastewater treated within the service area
- Provide narrative description on wastewater disposal and the name of the UWMP that applies to the plant receiving the effluent



TS5: Multiple wastewater facilities may occur within the UWMP'S preparer area. Untreated wastewater may be received from another agency.

- Complete Table 6-3 for the wastewater treated within the service area
- Summarize volumes reported in Table 6-3 by each separate facility

